Gobi Regional EconomicGrowth Initiative

P.O.Box-617
Ulaanbaatar-210646
Tel/Fax: 461145, 461048

Report work:

Improving Livestock Health through Herder Training

Amanda Fine, V. M. D

2002-06-20

Improving Livestock Health through Herder Training

Amanda Fine, V.M.D.

Scope of Work

- Assess the veterinary service (animal health) training program operated by the Gobi Initiative
- Recommend on-going activities necessary to achieve adequate veterinary care for selected herders
- Provide an assessment of veterinary services in Mongolia

Why Animal Health?

- Maintenance and improvement of animal health is an integral part of producing a high quality, valuable and marketable livestock product.
- More milk, more meat, more young, better hides, nicer hair and more markets

Why Train Herders?

- Mongolian herders today own their own livestock
- As livestock owners herders are responsible for the health of their livestock
- Mongolian herders need the knowledge to make decisions about livestock health and the skills to provide basic health care to their animals

Goals of an Animal Health Training Program for Herders

- Identification of sick and healthy livestock
- The application of management changes or simple procedures to improve animal health
- The identification of a disease outbreak and the need for professional assistance
- An analysis of the cost and benefits of animal health interventions

Animal Health Training Program: Evaluation

Govi-Altai

Uvurkhangai

Bayankhongor

Example: Foot and Mouth Disease

- Observe your livestock (cloven hoof) morning and night
- Symptoms: Reluctant to move, drooling
- Examine teats, interdigital space, and oral cavity for vesicles (flu id-filled) or ulcers (sores)
- Bring your livestock back to shelter and send word to your veterinarian

Subject Material: Recommendations

- Infectious Diseases: contagious agalactia, GID, diarrhea of newborns
- Herder Assessment of Animal Health
- When to Seek Professional Assistance

- Developing a Knowledge Base

Animal health training Program Implementation; Current Plan

- Development of Training Material
- Selection of Trainers
- Selection of Participants
- Length of Program
- Format of Lecture/Training
- Purpose of Training

Program Implementation: Recommendations

- Training materials must be developed centrally, specifically for the program
- Trainers should not be expected to deliver a consistent product based on a curriculum outline
- Herder participants should be supplied with materials to facilitate the transfer of information back to the herder group

Training Format: Herders as Animal Health Advisors

- A sustained effort and continuous information
- Combination of formal and informal training
- Opportunities for comment and feedback
- Efficient use of current structure of the Gobi Initiative program
- Information officers, radio programs, herder groups, regional offices

GTZ Extension Program

- Institutionalization of herder advicesystem
- Focus: animal health issues
- Four cycles developed: brucellosis, hypoderma, diarrhea and mange
- Operating in Uvs, Tuv, Zavhan and Dornogovi aimags
- Example: Hypoderma

GOAT HEALTH

Amanda Fine, V.M.D.

Written for ACDI/VOCA's "Pocket Book" for Cashmere Goat Breeders, 1999

This handbook highlights some of the most common infectious and non-infectious diseases affecting goat herds in Mongolia. We have focused on the diseases seen during the kidding season and those that affect the fertility of the breeding males and females. Cashmere breeding bucks and does and their offspring are very valuable animals. Measures should be taken to prevent disease outbreaks and ensure the health of the herd. This section of the herder manual is designed as an aid to herders in the prevention, diagnosis and treatment of some common diseases but is by no means complete and does not replace a good relationship with the local veterinarian. It is important that the herder establish a relationship with the local veterinarian to design a herd health program, treat common diseases and obtain an accurate diagnosis and effective treatment of unusual disease outbreaks.

INFECTIOUS DISEASES

DIARRHEA

Infectious causes of diarrhea include bacteria, viruses, and parasites. Changes in diet or over-treatment with antibiotics can also cause diarrhea. An examination and culture of the feces is necessary to obtain an accurate diagnosis.

Symptoms: Diarrhea is characterized by soft to watery stools and an increased frequency of defication. The color of the feces ranges from light tan to black. It may be streaked with blood or contain large amounts of mucus. A kid with diarrhea will often lose its appetite, have an elevated body temperature and become weak and listless. The kid will often die if not treated.

Treatment: No matter what the cause of the diarrhea it is important to replace the fluids being lost and prevent dehydration. Mongolians will often give the goat kid strong tea, reduce the kid's access to the dam (decrease feedings) and then give the kid newly prepared yogurt once the diarrhea has started to clear up. This treatment method is effective as long as the goat receives enough fluids. The yogurt is a natural way to repopulate the intestine of the goat with the right kind of bacteria. A recipe for fluid replacement and the calculations for determining how much the kid should receive are included at the end of the Goat Health section.

If the goat kid has a fever, is very weak, or has bloody or very watery diarrhea, an infectious agent probably causes the symptoms. Salmonella, E. coli and coccidia are probably the three most common causes of diarrhea in young kids. In these cases treatment with antibiotics or anti-parasitic drugs in addition to the fluid therapy will be necessary.

Prevention:

- Ensure that the kids receive an adequate amount of good quality colostrum within the first 6 hours of life. An adequate amount of colostrum is 5% of the animals body weight in the first 6 hours of life followed by another 5% in the next 12-24 hours of life. Feeding collostrum for the first 3 days of life will prevent disease.

- Keep the kids' environment warm and clean with dry bedding, fresh air, etc.

- Keep newborn kids with their mothers and allow them to nurse naturally (frequent suckling of small quantities of milk).

- Isolate sick kids from the rest of the young.

PNEUMONIA/COUGH

Bacteria, viruses, parasites or fungal agents may cause pneumonia in goats. Any type of stress like exposure to extreme cold, dust, a lack of ventilation, starvation, or movement over long distances will decrease the goat's ability to fight disease and make them more susceptible to the agents that cause pneumonia.

Symptoms: Pneumonia or respiratory disease is characterized by a fever, discharge from the nose and sometimes the eyes, a dry or wet cough and changes in the rate and type of breathing. If the pneumonia is very severe the goat will breathe through an open mouth and be reluctant to move because the chest area is so painful.

Treatment: Goats that are showing signs of pneumonia should be kept in a warm, well- ventilated place. Their feed intake should be monitored to make sure they are getting enough Bacterial pneumonia should be treated with antibiotics Vaccination against pneumonia is not very successful.

Prevention:

- Ensure that the kids receive an adequate amount of good quality colostrum within the first 6 hours of life.

- Keep the kids' environment warm and clean with dry bedding, fresh air, etc.

- Reduce stress in any way possible by reducing changes of environment, keeping kids as warm as possible during the winter and providing adequate nutrition.

NAVEL ILL/JOINT ILL

Navel ill and joint ill (omphalitis or septic arthritis) are caused by many different kinds of bacteria that gain entry into the kids body via the umbilical cord or wounds.

Symptoms: Bacterial infections of the umbilical stump can result in a number of symptoms. The umbilical stump itself is often enlarged, warm to the touch and painful. Occasionally there will be a bad smelling white to yellow discharge from the stump. The kid will often have a fever and will lose its appetite. If the bacterial infection from the umbilicus gets into the blood it will often spread to the joints and cause joint ill. The kid will have warm and swollen leg joints and may be reluctant to move.

Treatment: Since navel and joint ill are caused by bacteria they must be treated with antibiotics. Keeping the kid warm and well fed is also important. The infected umbilicus can be cleaned daily. A disinfectant (1 teaspoon of creolin mixed with 1 liter of boiled water) can be used for the cleaning. A compress can be made with cotton wool soaked in vodka or alcohol.

Prevention:

- Ensure that the kids receive an adequate amount of good quality colostrum within the first 6 hours of life.

- Provide a clean, dry area for kidding.

- Dip the umbilicus in 7% iodine right after birth and for the first 24-48 hours of life.

SORE MOUTH OR CONTAGIOUS PUSTULAR DERMATITIS OR ORF

Sore mouth is caused by a virus and can easily pass form goat to goat and also has the potential of infecting other species including humans.

Symptoms: The oral form of sore mouth is characterized by sores, scabs and pox-like lesions around the lips and gums of young goats. Occasionally lesions will appear in the interdigital space between the toes or on the udder of does nursing kids with the disease. Most kids will eventually recover from the disease but the pain of the sores may stop them from nursing.

Treatment: The kid must be hand fed or tube fed milk from the mother during this time since nursing is too painful. A soft ointment or petroleum jelly (Vaseline) can be placed on the sores to help them heal and decrease the pain In Mongolia salted black tea has been used on the sores. This liquid may help to clean and heal the sores.

Prevention:

- A sore mouth vaccine is available in Mongolia and should be used in herds with the disease.

- Isolate affected animals.

* This disease is contagious to people and herders must handle the animals carefully to avoid infection. Ideally people should wear gloves when handling the animals.

CONTAGIOUS AGALACTIA

Contagious Agalactia is a disease of small ruminants (goats and sheep) and is caused by a bacterium called *Mycoplasma*.

Symptoms: The disease appears at or shortly after the time that the female gives birth. Signs of the disease include a hot and swollen udder and thick and yellow milk which soon becomes watery and leads to an eventual loss of milk production. Polyarthritis, or the swelling of multiple joints, is often seen. Keratoconjunctivitis or inflammation of the eye is less common but also observed.

Treatment: A vaccine against Agalactia is produced in Mongolia and treatment has been attempted with a 2% lugols iodine solution but the results are variable.

Prevention:

- They key to controlling Agalactia in a herd is isolating the sick animals from the unaffected goats. The goats with Agalactia should be milked separately.

- If possible the kids should be separated from the infected does and fed boiled colostrum milk to prevent transmission of the mycoplasma to the kid.

- Milking adults should be kept separated from the younger goats in the herd to avoid transmission.

PINK EYE

Pink eye in goats can be caused by a number of different agents including viruses and bacteria such as mycoplasma and chlamydia.

Symptoms: Pink eye is characterized by red and watery eyes, swelling of the eyelids, squinting to keep the sun out and a cloudiness of the clear part of the eye. Sometimes an ulcer or pit may appear on the surface of the eye. The ulcers can rupture and cause blindness.

Treatment: Many of the lesions will heal in 1-4 weeks if an effort is made to keep the eye covered with a patch or at least keep the animal out of the direct sun and protected from flies. Eye ointments or tetracycline antibiotic treatment can help cure the disease.

Prevention:

- Infected animals should be isolated to reduce spread through the herd.
- Reducing flies by grazing the animals in cooler areas without flies or using a repellant will reduce transmission of the disease.

ENZOOTIC ABORTION

Enzootic abortion in goats is caused by the bacterium Chlamydiapsittaci.

Symptoms: Does usually abort late in gestation, in the last few weeks of pregnancy. Abortions may also be seen in early pregnancy if the doe was exposed to the disease in late gestation of the previous year. The placenta of a doe with Chlamydiapsittaci will have small white to yellow areas of necrosis throughout the tissues. Kids may also be born full term but they are often weak and fail to survive.

Treatment: The aborting does should be isolated and treated with tetracycline antibiotics to clear the infection.

Prevention:

- Isolate does which have aborted.
- Burn or bury the aborted kids and other tissues.
- Vaccinate does with the Chlamydm vaccine Immunity lasts approximately three years so the individual animals should be vaccinated at least every three years

BRUCELLOSIS

Brucellosis is caused by a bacterium called Brucella melitensis but can be caused by other species of Brucella as well.

Symptoms: Goats can show vague symptoms including mastitis, lameness or slightly loose stool Does may abort in the final 4 to 6 weeks of pregnancy The males may have swollen joints or testicles

Treatment: There is no effective treatment for goats with Brucellosis. They should be eliminated from the herd by slaughter and used for meat.

Prevention:

- Bury or burn any aborted material. It is believed that the most common route of transmission is the ingestion of the Brucella organism from these materials or from ground contaminated by aborted material.

- Try not to purchase or bring any positive goats into the herd

- Brucellosis can infect humans Special care must be taken when handling aborted materials from the goats or drinking goat milk Herders should protect their hands and arms if assisting a doe in the birthing process and then wash with soap and water immediately after assisting or handling any aborted material. Milk and milk products should be fully boiled and meat thoroughly cooked.

LAMENESS OF GOATS

Lameness in goats can be caused both by infectious and non-infectious agents. Infectious lameness is often called foot rot and is caused by the invasion of two different bacteria, Fusobacterium and Fusiformis into the hoof. The goats' legs and hooves can also be damaged by snow and ice resulting in wounds and swelling of the lower legs.

Symptoms: With foot rot the goats will show signs of lameness and their hooves will appear soft and rotten and have a bad odor. Wounds on the legs will appear as red and irritated areas and the hair around the coronary band may fall out. Treatment: Foot rot is treated by removing the dead tissue of the hoof with a sharp knife until healthy tissue is found. Goats can then be made to walk through a disinfectant like copper sulfate or a 10% formalin solution. Wounds on the legs should be cleaned with warm water and soap and then irrigated with a salt solution. The wounds can be wiped with cotton wool soaked in alcohol and then disinfected with an iodine solution.

Prevention:

- Move goats from contaminated enclosures for a period of 4 weeks if foot rot appears in the herd.

- Try to graze goats with wounds and abrasions in areas where they will not be further aggravated by sharp ice or snow.

- Keep enclosures dry and clean.

NON-INFECTIOUS DISEASES

GASTROINTESTINAL DISFUNCTION

Gastrointestinal disfunction includes **rumen bloat, impaction, choke, acidosis** and **indigestion**. Gastrointestinal dysfunction is usually related to changes in feed or feeding conditions.

Symptoms: Rumen bloat is caused by an abnormal accumulation of gas in the rumen and is characterized by pain, discomfort, difficulty breathing and an obvious fullness of the left flank that sounds like a drum when thumped. I**mplication** can be caused by the consumption of poor quality

forage that is difficult to break down. Feed will become stuck in the rumen and gun motility will cease **Choke** is the result of feed being stuck in the esophagus. The goat will regurgitate feed and the obstruction can often be palpated in the neck **Acidosis and indigestion** are the result of a change of pH in the rumen. The goat eating too much grain or other kinds of feed with a high amount of starch or sugar often causes this. Depending on the seventy of the case the goat may lose its appetite, grind its teeth, develop diarrhea and become severely dehydrated.

Treatment: A goat with rumen bloat should be encouraged to get up and move around. A piece of wood can be tied in the mouth to stimulate salivation. A tube can be passed down the esophagus to help relieve the gas and if that does not work it may be necessary to place a trocar or large needle through the body wall into the rumen to relieve the gas. The trocar should be placed in the most prominent portion of the left flank. Impaction can sometimes be corrected with the administration of fluids (water) or mineral or vegetable oil given orally. Severe impaction, however, might require a rumenotomy that must be done by a veterinarian. Choke can often be corrected by passing a tube into the esophagus and gently pushing the obstruction into the rumen. Acidosis and indigestion can often be treated with oral administration of a mixture of charcoal and sodium bicarbonate and some vegetable oil. A mild laxative like magnesium sulfate may also be helpful. A mixture of water, ash and wood coal can replace the charcoal bicarbonate and a greasy meat broth can replace the use of vegetable oil.

Prevention:

- Provide goats with good quality pasture and forage.
- Do not make sudden changes in the feed available to the herd.

INTOXICATION

Chemicals, toxic plants and spoiled forages all have the potential to cause intoxication in goats.

Symptoms: The symptoms of intoxication will vary depending on the intoxicant and the amount the animal ingested or was exposed to. In general intoxicants will affect the gastrointestinal system, the nervous system or the renal and cardiac system. General signs include increased salivation, vomiting, diarrhea, respiratory and circulatory disturbances and abnormal behavior.

Treatment: Appropriate treatment will depend on the type of toxin that was ingested or to which the goat became exposed. If a toxin has been ingested you want to clear it from the system either by passing a tube through the esophagus and lavaging the stomach (getting the contents out) or by surgically performing a rumenotomy and emptying the rumen contents. The toxin can sometimes be absorbed by placing charcoal mixed with water in the stomach through a tube. Sour milk can also be used to neutralize some types of toxins. If the goat has been exposed to a toxin through contact on the outside of the body if will be helpful to attempt to clean the goat thoroughly with water and soap to get the chemical off the hair.

Prevention:

- Do not graze goats in pasture known to contain toxic plants.
- Check forage for moldy areas before feeding to livestock.
- Do not allow goats to access water know to be contaminated with chemicals

- Use dipping and other insecticide-like materials in a well-ventilated area and as directed by the label or your veterinarians.

General Warning Signs

The diseases listed above are just a few of the more common conditions seen in goats and a sample of those diseases seen in goat herds during the kidding season. The most important thing a herder can do to prevent the diseases listed above is to insure that newborn kids receive colostrum in their first 6-8 hours of life. Keeping the kids warm, clean, dry and well fed in the first days of their life will also have an incredible impact on their survivability.

When an outbreak of disease occurs, for example when more than 2 to 3 animals are affected with the same symptoms, a veterinarian should be called to make a diagnosis and prescribe treatment. It may cost some money to have the needed testing preformed but if the correct treatment is instituted it will same money and animals in the long run.

If there is ever any sudden or unexplained death in the herd the carcass should be kept so that the veterinarian can perform a post mortem exam. The exam may reveal information that could protect the rest of the herd from the disease. If a large number of goats or other animals in the herd should become ill, abort, have difficulty giving birth or die, veterinary assistance should be requested immediately.

Preventing Disease

Vaccination

All goats in the herd should be vaccinated against Clostridium perfringes types C and D (Enterotoxemia) and Clostridium tetani (Tetanus). Young goats from a herd with a history of contagious ecthyma (soremouth) should also be immunized with a contagious ecthyma vaccine. Vaccination with the Rev-1 strain against Brucellosis in goats is recommended in Mongolia. Vaccines against Chlamydia are also available. If the herd has experience high rates of abortion and Chlamydia is suspected the Chlamydia vaccine should be administered to the herd before breeding. Anthrax vaccination should also be considered in areas where the disease is present. If Anthrax vaccination is instituted goats should be vaccinated and then boostered 2-3 weeks later and then vaccinated yearly.

Vaccine Schedule:

Kids: Enterotoxemia and Tetanus vaccine at 12 weeks of age followed by a booster (2nd injection) 14-28 days later. Rev-1 vaccine as recommended by veterinarian and contagious ecthyma vaccine at 6-8 weeks of age if soremouth is a herd problem.

Adult Does: Enterotoxemia and Tetanus vaccine yearly. These vaccines should be administered during the last 30 days of gestation. This is when the doe is producing colostrum. If the doe is vaccinated during the last 30 days of gestation antibodies for Enterotoxemia and Tetanus will be present in the colostrum and will protect the kids for 4-6 weeks. Anthrax vaccination and Chlamydia vaccination should be done yearly before the breeding season (non-pregnant) if necessary.

Adult Bucks: Enterotoxemia and Tetanus vaccine yearly. Anthrax and Chlamydia vaccination should be done yearly before the breeding season if necessary.

Parasite Control

Parasitic diseases are responsible for severe clinical syndromes and profound production losses especially when young animals and pregnant does are subsisting on substandard planes of nutrition. Parasite disease prevention is therefore very important.

Internal Parasite Control

Internal parasites include nematodes, tapeworms and protozoan parasites. Internal parasite transmission is most common when the weather is warm and wet because the eggs of the parasites are shed in the dung which then infects the pasture. In Mongolia internal parasite transmission is probably most common in the summer months.

Symptoms: Signs of disease caused by internal parasites include diarrhea, weight loss and loss of an interest in feed. Internal parasites can also cause blood loss and loss of protein which results in pale mucous membranes and edema (fluid collecting under jaw).

Treatment: Goats, adults and especially the kids, should be treated with an anthelmentic when suffering from internal parasites. An effort should be made to identify the type of parasite the goat is infected with by analyzing the feces. Anthelmentics available in Mongolia include ivermectin and fenbendazole. Coccidia, a protozoan parasite, will need to be treated with a different type of drug. Drugs for coccidia include amprolium and sulfamethazine.

Prevention:

- All goats in the herd should be treated right before the summer months for internal parasites. This will hopefully reduce the contamination of the pasture during the warm, rainy months when transmission is highest Treatment should also be repeated in the late fall to kill the parasites before they become arrested in the body.

- Efforts should be made to keep goat pens clean and dry.

- The density of goats per pen, especially with goat kids, should be kept to a minimum.

External Parasite Control

Lice and mange are the most common kinds of external parasites on goats, however, ticks and flies can also affect them.

Symptoms: The general signs of external parasites on goats include itching, hair loss and weight loss. A severe infection with lice can also cause significant blood loss and severe mange often results in scab formation.

Treatment/Prevention:

- The most common type of prevention and treatment for external parasites in goats is dipping in an insecticide bath. This should be done yearly and sometimes 2 times a year if there is a high rate of infection in the herd. Caution should be used when dipping young animals because they are more susceptible to the insecticides and dipping milking does or does in late pregnancy should be avoided. There are many different types of dipping materials and they should be used as directed by the label and the veterinarian.

- Treatment of lice must be done at 2-week intervals for 2 to 3 treatments to break the lice life cycle and cure the goat. The whole herd must be treated. Injectable and oral ivermectin are effective against biting lice and insecticide powders are available to treat individual goats.

- If possible areas with a high density of ticks (tall grasses, etc.) should be avoided.

- If possible graze goats in shaded and cool areas where flies and other insects are less prevalent.

- In addition to chemical insecticide dips, powders and injectable drugs, some natural insecticides can be used to protect the goats from external parasites. Plants such as jwripems sabin and artemisia and the ash of dung have been reported in the Mongolian literature as good repellants for lice. These plant powders and ash can be sprinkled on the litter of goat pens.

- The Mongolian literature also reports that a post smeared with horse or marmot grease and covered with soot and powder ofjuniperus sabina and artemisia will act as an attractant to ticks. These posts can be set up away from animal enclosures to draw the ticks away from the goats.

Fluid Therapy for Kids with Diarrhea:

Kids must drink 10% of their body weight in milk or a replacement fluid per day. If the animal is dehydrated that fluid loss must be corrected and the ongoing losses from the diarrhea must be replaced.

To estimate the amount of fluid that must be given to a kid per day use the following formula.

Weight in Kg X 10% + Weight in Kg X % dehydration + losses in L = fluid replacement

The percent dehydration is determined using the guidelines below:

Fluid Loss	Signs
0-5%	None
6-8%	Dry mouth, skin remains erect when pinched
10%	Body cold, unable to stand
12%	Flat on side, near death

Example: A 1-week-old kid weighing approximately 3 kg has had diarrhea for 2 days. It is weak with a dry mouth and when you pinch the skin above the eyes it stays erect. It is passing approximately 20 ml of watery diarrhea every 6 hours. To determine the fluid replacement rate for this kid you would do the calculation below:

3 kg X 10% (.1) + 3 kg X 7% (.07) + .08 L (80 ml) = 0.59 L (590 ml)

The amount calculated for fluid replacement should be administered in 3-4 feedings over 24 hours. So the kid in the example should receive 4 feedings of approximately 150 ml of fluid per day.

When the goat kid has diarrhea it is not able to digest its mother's milk and must be provided with a replacement. Below are recipes for fluid replacement that you can make at home. The fluid must have an easily digestible sugar or energy source as well as the salts and electrolytes that the kid is losing with the diarrhea. The kid should be fed only the fluid replacement for two days and then gradually put back on milk

The fluid should be administered to the kid in a bottle or by a tube into its stomach if it will not suck. If using a tube make sure that it is small and soft and that it is not in the lungs. If the tube is in

the right place you should hear bubbles in the kid's stomach when you blow gently on the tube. If it is in the lungs the kid will cough and struggle.

The fluid should be warm and freshly prepared. If replacement fluid is stored for more than 1 day it should be frozen and reheated before use.

Once the diarrhea is clearing up feed the goat kid some freshly prepared yogurt. This will replace the good bacteria in its stomach that was lost when it had diarrhea.

Fluid Replacement Recipe:
10 g of salt
5 g soda (sodium bicarbonate)
120 gofsugar
4.5 L of water

Sources:

Ajello, Susan, editor. The Merck Veterinary Manual. Eighth Edition. Merck & Co., Inc., Whitehouse Station, N.J., U.S.A., 1998.

Smith, Bradford. Large Animal Internal Medicine. Second Edition. Mosby-Year Book, Inc., 1996.

Thedford, Thomas. Goat Health Handbook^ A Field Guide for Producers with Limited Veterinary Services. Winrock International, 1983.

English Language Version of Final Draft (On the Mongolian version was formatted for publication)

Livestock Health, Ulaanbaatar, 2001. Published by the UNESCO "Let's Learn and Live" Distance Education Project and ACDI/VOCA "Farmer to Farmer" Project

Authors: D. Mendjargal, Z. Batsukh, J. Baigalmaa
Advisor; Amanda Fine
Editor: B. Enkhbat
Artist: L. Olzi-Bat
Designer: Ch. Suvd

INTRODUCTION

Herding the five animals has been an important part of Mongolian life for centuries and is still very important today. A herders' responsibilities for his or her individual livestock has increased as Mongolia has privatized its livestock and most recently its veterinary system. Herders today must make decisions about their livestock's health and strive to increase their livestock's productivity. This book is designed to give herders the skills to recognize health problems and disease in their livestock. The book will give herders a greater understanding of the things that cause disease in their livestock and advise on ways to treat and prevent those diseases.

It is important to recognize, prevent and treat livestock diseases in your herds for multiple reasons. Firstly, you and your family's security is dependent on the health and productivity of your livestock. Sick livestock die, do not survive extreme weather, produce less milk and produce less wool and cashmere and lower quality hides. Sick livestock means less milk and meat for your family and less wool and cashmere to sell in the market for cash. It is also important to be able to

recognize disease in your livestock because some of their diseases can be passed on to you and your family. It is important to be able to recognize these diseases in your livestock and protect yourself and your family. Lastly, Mongolia as a nation is dependent on the health and productivity of its livestock. The livestock agricultural sector and the meat and livestock products it produces make up a large part of Mongolia's economy.

The work of a herder is never done. It involves not only the work of an animal doctor but also the work of a geographer, plant specialist, breeding specialist, weather forecaster and animal tamer. It is hard work and requires knowledge and skill. Livestock health begins with a skilled and aware herder. Veterinarians should be sought out for advice and assistance and everyone should work together to ensure the health and productivity of Mongolia's livestock.

First chapter

LIVESTOCK HEALTH

This chapter will focus on the difference between healthy livestock and sick livestock, symptoms of livestock illnesses and diseases, the damage caused by disease and the importance of keeping livestock healthy.

By reading this chapter you will learn:

- To distinguish between a healthy and a sick animal
- To classify different types of illnesses
- How sick livestock can mean less milk, meat, wool and cashmere

What is the difference between a sick animal and a healthy animal?
It is extremely important that herders be able to distinguish between healthy animals and sick animals. Usually healthy animals are active, with a shiny coat, relatively fat, calm and have a good appetite. Sick animals may be less active and may fall behind the herd They often do not have a very good appetite and may be showing some signs of disease like diarrhea or a hot and swollen udder You do not have to be a qualified veterinarian to examine an animal to determine if it is sick or healthy Below is a method to use when examining your animal for illness The method is a combination of observation of animal behavior, conducting a physical exam, and evaluation of the animal's temperature, pulse and respiration rate.

Behavior:
Changes in behavior often indicate that an animal is sick As a herder you are very aware of normal behavior in your livestock. A healthy animal grazes with the herd, has a good appetite, produces milk and grows hair or wool. Healthy young livestock suckle with enthusiasm, run and jump and stay close to their mothers.

Changes in behavior may be your first clue that your animal is sick. Observe your livestock daily and look for changes in behavior. Signs that may indicate a sick animal include the following.

(Picture of sick animal: separated from herd and then)
Separation or lagging behind the herd from the herd
Poor general condition
Loss of appetite
Decrease in milk production
Dull and depressed attitude
Obvious limping or stiff movement

Changes in behavior that may indicate that an animal is in pain include the following;
(Picture of animal in pain: arched back and grinding teeth)

Loss of appetite
Decreased milk production
Grinding of teeth
Getting up and lying down constantly
Standing with an arched back
Vocalization or grunting
Salivation and ocular discharge (painful mouth or eye)
Stiff gait

If you see any of your livestock exhibiting any of the signs above get closer, gently restrain the animal and perform a physical exam.

Nose to Tail: Physical Exam
(Drawing of sheep or goat, side view, with reminders, ie. check nose for discharge,look for sores around the feet)

Start at the nose of the animal and make your way to the tail looking for abnormalities along the way. Lay your hands on the animal and FEEL, SMELL, LISTEN, and LOOK as you work your way from the nose to the tail. Keep in mind what you would expect to find on a normal, healthy animal and note any abnormalities.

Body Part	Normal	Abnormal
Nose	Cool, moist, no discharge. Clean smell. Air passing through both nostrils. No sores or blisters.	Dry or cracked skin. Bad smell. Sounds of harsh breathing. Discharge (clear, yellow, green or bloody). No airflow through one or both nostrils.
Mouth/Oral Cavity	Moist gums No pain or dropping of grass from mouth. No swelling, sores or blisters.	Dry gums Broken teeth. Bad smell. Swelling or pain.
Eyes	Bright and clear. Responsive to stimulus. Equal size and orientation of pupils.	Cloudy or bloody. Presence of discharge. Blinking constantly. Unresponsive to stimulus. Pupils unequal in size or oriented in different directions.
Ears	Erect and alert. No discharge. Clean smell.	Unresponsive to noise. Bad smell or discharge.
Neck	Symetrical and strong.	Swelling or mass. Painful when touched.
Chest	Even breathing Ribs felt but not seen.	Rapid or irregular breathing. Crackles of air heard under the skin
Abdomen	Bulge of rumen on left. Contractions of the rumen heard and felt (2/minute)	No swelling near the back (air). No swelling near the belly (fluid)

Udder	Soft and not painful. Equal distention of teats. Free of sores or crack. White milk with no odor.	Hot or painful. Unequal size of teats. Yellow, clear or milk with clots. Sores, raised growths or cracks.
Penis	No pain or swelling. Held in sheath.	Swelling present. Bloody or yellow discharge.
Vulva	Pink moist skin. No discharge. No sores.	Dry or cracked skin. Yellow discharge with bad smell. Signs of tears or sores
Testes	Same size. Non-painful. Firm and moveable.	Presence of swelling. Painful on palpation. Soft or very hard. Not moveable in scrotum.
Limbs	Free range of movement. Symetrical with no signs of pain.	Limping or holding of foot off ground. Swelling of joints and stiff movement.
Feet	Non-painful. Even growth of hoof wall. No swelling.	Painful. Uneven or overgrowth of hoof wall. Presence of sores or discharge. Signs of pain.
Muscles	Equal cover of muscles from head to tail. Normal smooth gait.	Pain or swelling. Unequal muscle mass.
Skeleton	Movement is smooth. No limps or obvious broken bones.	Abnormal movement. Pain over bone or obvious break. Crackles of broken bone, swelling or increased range of motion.
Skin/Hair	Full hair cover. Shiny coat. Intact skin.	Areas with no hair or wool. Flakes of dry skin or sores and cracks.
Tail	Clean and responsive. Erect or twitching.	Presence of discharge or fecal material. Not erect/twitching or responsive.

Temperature, Pulse and Respiration:

The exam method above allows you to evaluate the animal from nose to tail using all of your senses. There are also three things that you can measure to give you an idea of the health status of the animal. You can measure the animal's temperature, pulse rate and breathing rate. On a healthy animal these should be within the normal range. In a sick animal they are often abnormal and are either too high or too low.

It is important to know the normal temperature, pulse rate and breathing rate of animals and know how to measure these on the animals (table 1).

Livestock	Sheep, goats	Horses	Cattle	Camel
Normal temperature, C	38-40	37-38	37-39	36—38
Pulse rate per minute	70-8	24-42	40-80	32-60
Breathing rate per minute	16-20	8-16	10-30	5-12

You will need a watch or clock with a second hand and a mercury glass thermometer for this exercise. To measure temperature, a thermometer is inserted into the anus and removed after 2-5 minutes. Read the temperature immediately after removing the thermometer. Breathing rate is measured by watching the rise and fall of the chest/abdomen or by placing a palm near the nose of the animal and counting the breaths per minute. The pulse rate can be determined by feeling the pulse on any of the big arteries or by placing you hand over the heart up under the left front limb of the animal and counting the beats per minute.

Symptoms, Signs and Organ System

Now that you have completed a physical exam you are ready to categorize the abnormalities you have observed or symptoms of disease by organ system. This will help you and the veterinarian diagnose the cause of your animal's illness and determine how to treat it.

Organ System	Common Signs of Abnormalities
Nervous	Head tilt or circling. Changes in gait. Abnormal eyes (uneven pupils or blindness).
Cardiovascular	Increased or decrease in heart rate. Pale gums or eyes. Pulses hard to find.
Respiratory	Increased or decreased respiratory rate. Nasal discharge. Abnormal breathing sounds.
Gastrointestinal	Diarrhea or scant to no fecal production. Bloat or swelling of the abdomen. Mass in esophagus
Musculoskeletal	Stiff or abnormal gait. Painful swellings on limbs. Uneven musculature.
Reproductive	Bad smelling or yellow discharge from vulva or penis. Presence of sores or growths. Enlarged or painful testes.
Integument (skin)	Signs of scratching. Rough coat or hair loss. Sores, cracks or cuts in skin.
Udder	Hot to touch. Swollen and painful. Clear watery milk or thick milk with flakes. Yellow milk with bad smell.

Causes of Livestock Diseases

Now that you can identify sick animals we will discuss the causes of illness in livestock. When livestock are unhealthy their illness is usually caused either by an infectious agent (bacteria, virus, parasite or fungus) or by a non-infectious disease. It is possible that some livestock will suffer from a combination of illnesses. For example an animal suffering from poor nutrition (a non-infectious disease) will be more likely to acquire bacterial pneumonia, an infectious disease.

Infectious Diseases
Infectious diseases are those caused by disease causing organisms or pathogens. Infectious diseases can be caused by microorganisms that you cannot see including include viruses, bacteria and fungi. Viral, bacterial and fungal diseases often pass between livestock or are contagious. They can pass in the air, by contact with body fluids like saliva or urine or they can pass by contact with infected needles, castration tools or infected feed or pasture.

Signs of infectious diseases in livestock include an elevated temperature, loss of appetite and depression or decreased level of activity. You will also see signs specific to the organ system affected. For example if the animal has a bacterial infection of the lungs it will have an elevated body temperature, increased respiratory rate, yellow nasal discharge and coughing.

Infectious diseases can also be caused by parasites. Parasites are classified as any organism that lives on or within another organism receiving some benefit from its host. When veterinarians refer to parasites they are usually referring to helminth (worm) or arthropod (insect) parasites. Parasites can also pass from animal to animal and are considered contagious diseases. You will learn more about identifying parasites and their life cycles in the next chapter.

Signs of parasitic diseases include weight loss, a rough hair coat, scratching and sometimes depression and inactivity. Again the signs give you a clue as to which organ system is affected by the parasite. If the animal is losing weight, has diarrhea and is weak it may have a parasite of the gastrointestinal tract.

Non-Infectious Diseases
Non-Infectious diseases are those that are not caused by a pathogen or infectious agent. Non-infectious diseases include disease resulting from poor nutrition or poor pastures. An animal must have enough to eat to grow fat in the summer and maintain its condition in the winter. It must also have an adequate amount of minerals and vitamins. Most animals receive all they need from grazing but it depends on the pastures in your area. Animals can get sick if they have too many minerals and micronutrients (salt poisoning or copper toxicity) and they can also get sick if they have too little (iodine deficiency or white muscle disease—selenium deficiency).

Other diseases that are considered non-infectious are those that are caused by cancer. Cancer usually affects older animals in your herd and is not very common.

Diseases or malformations that animals are born with like angular limb deformities or bleeding disorders are also considered non-infectious.

Diseases of animals that result from trauma or exposure to a difficult environment are also non-infectious. Animals that die of cold exposure, hypothermia, or are sick due to lack of fodder are suffering from non-infectious disease.

Non-infectious diseases are not contagious. They cannot pass from animal to animal. It is possible for many animals in your herd to suffer from a non-infectious disease like iodine deficiency but they have all acquired the disease due to a deficiency in their environment and not because they have passed the disease form one to the other.

The Cost of Livestock Disease
Livestock disease costs the herder food, money, security and time. Identifying sick livestock and taking the steps necessary to prevent and treat disease in your livestock is, therefore, very important.

Many diseases cause a decrease in milk production. A decrease in milk production will mean less milk for your family to drink and use for dairy products, it will mean less excess milk or dairy products available for sale in the market and it will mean less milk available for young livestock Less milk in young livestock will mean less growth, weakness and greater susceptibility to disease.

Many diseases also cause weight loss or lack of growth. Weight loss in your livestock means less meat for your own consumption and less meat for sale. Internal parasites often contribute to your livestock's lack of weight gain. If the market price for meat is 1,000 Tg/kg you can see that even a small difference in weight (2-5 kg) can mean a big difference in the value of your livestock.

External parasites are often blamed for damage to hides and wool. Although market prices for hides can be as high as 20,000 Tg for a cattle skin it must be in good condition. Hides that have been damaged by ticks, lice and fly larvae are often rejected resulting in a significant economic loss.

Some diseases only cause slight losses in milk production, weight gain or hide quality but other diseases can cause death. The loss of young livestock to respiratory and diarrheal diseases results in the loss of their potential as adult producing animals. The herder must think not only of the value of the livestock lost but also of their potential value as adults or reproducing females.

Diseases in livestock also make them more susceptible to other environmental and management factors. Healthy livestock will be more able to survive drought, storms, snow and dzud.

Second chapter

LIVESTOCK DISEASES: INFECTIOUS, NON-INFECTIOUS and PARASITIC

In the previous chapter we discussed ways of identifying sick animals and attempting to determine which organ system was affected. In this chapter we will introduce a number of general categories of illness that affect livestock and will outline ways of treating and preventing these diseases. We will discuss infectious and non-infectious diseases separately. Remember, infectious diseases are usually caused by bacteria, viruses, parasites or fungi. Non-infectious diseases are those that result from nutritional deficiencies, poor management practices, bad genetics, trauma or neoplasia (cancer).

INFECTIOUS DISEASES

DIARRHEA (Picture)

Infectious causes of diarrhea include bacteria, viruses, and parasites. Changes in diet or over-treatment with antibiotics can also cause diarrhea. An examination and culture of the feces is necessary to obtain an accurate diagnosis. This would need to be done by a veterinarian. You, however, can identify diarrhea, work to treat the disease and take measures to stop its spread.

Symptoms: Diarrhea is characterized by soft to watery stools and an increased frequency of defication. The color of the feces ranges from light tan to black. It may be streaked with blood or contain large amounts of mucus. Young livestock with diarrhea will often lose their appetite, have

an elevated body temperature and become weak and listless. The young livestock will often die of dehydration (fluid loss) if not treated.

Treatment: No matter what the cause of the diarrhea it is important to replace the fluids being lost and prevent dehydration. Mongolians will often give young livestock strong tea, reduce the young livestock's access to the dam (decrease feedings) and then give the young livestock newly prepared yogurt once the diarrhea has started to clear up. This treatment method is effective as long as the animal receives enough fluids. The yogurt is a natural way to repopulate the intestine with the right kind of bacteria. A recipe for fluid replacement and the calculations for determining how much the animal should receive are included at the end of this section.

If the young animal has a fever, it is very weak, or has bloody or very watery diarrhea, an infectious agent is probably causing the symptoms. Salmonella, E. coli and coccidia are probably the three most common causes of diarrhea in young livestock. In these cases treatment with antibiotics or anti-parasitic drugs in addition to the fluid therapy will be necessary. Contact your veterinarian for an appropriate treatment.

Prevention:

- Ensure that the young animals receive an adequate amount of good quality colostrums (first milk) within the first 6 hours of life. An adequate amount of colostrum is 5% of the animals body weight in the first 6 hours of life followed by another 5% in the next 12-24 hours of life. Feeding collostrum for the first 3 days of life will prevent disease.
- Keep the young animals' environment warm and clean with dry bedding, and fresh air.
- Keep newborn animals with their mothers and allow them to nurse naturally (frequent suckling of small quantities of milk).
- Isolate sick animals from the rest of the young to prevent the spread of disease.
- Clean out pens regularly and leave exposed to direct sunlight.

PNEUMONIA/COUGH (Picture)

Bacteria, viruses, parasites or fungal agents may cause pneumonia in livestock. Any type of stress like exposure to extreme cold, dust, a lack of ventilation, starvation, or movement over long distances will decrease the livestock's ability to fight disease and make them more susceptible to the agents that cause pneumonia.

Symptoms: Pneumonia or respiratory disease is characterized by a fever, discharge from the nose and sometimes the eyes, a dry or wet cough and changes in the rate and type of breathing. If the pneumonia is very severe the animal will breathe through an open mouth and be reluctant to move because the chest area is so painful.

Treatment: Animals that are showing signs of pneumonia should be kept in a warm, well-ventilated place. Their feed intake should be monitored to make sure they are getting enough. Bacterial pneumonia should be treated with antibiotics. Vaccination against pneumonia is not very successful.

Prevention:

- Ensure that newborn animals receive an adequate amount of good quality colostrum within the first 6 hours of life.
- Keep the animals environment warm and clean with dry bedding, fresh air, etc.
- Reduce stress in any way possible by reducing changes of environment, keeping animals as warm as possible during the winter and providing adequate nutrition.

NAVEL ILL/JOINT ILL (Picture)

Navel ill and joint ill (omphalitis or septic arthritis) are caused by many different kinds of bacteria that gain entry into the young animals body via the umbilical cord or wounds. Bacteria that causes intestinal disease and pneumonia can also travel through the blood and into the joints causing infection there.

Symptoms: Bacterial infections of the umbilical stump can result in a number of symptoms. The umbilical stump itself is often enlarged, warm to the touch and painful. Occasionally there will be a bad smelling white to yellow discharge from the stump. The young animal will often have a fever and will lose its appetite. If the bacterial infection

from the umbilicus gets into the blood it will often spread to the joints and cause joint ill. The young animal will have warm and swollen leg joints and may be reluctant to move.

Treatment: Since navel and joint ill are caused by bacteria they must be treated with antibiotics. Keeping the young animal warm and well fed is also important. The infected umbilicus can be cleaned daily. A disinfectant (1 teaspoon of creolin mixed with 1 liter of boiled water or iodine diluted with water) can be used for the cleaning. A compress can be made with cotton wool soaked in vodka or alcohol.

Prevention:

- Ensure that the young animals receive an adequate amount of good quality colostrum within the first 6 hours of life.
- Provide a clean, dry area for kidding, lambing, calving or foaling.
- Dip the umbilicus in 7% iodine right after birth and for the first 24-48 hours of life.

SORE MOUTH OR CONTAGIOUS PUSTULAR DERMATITIS OR ORF (Picture)

Sore mouth is caused by a virus and can easily pass form animal to animal and also has the potential of infecting humans.

Symptoms: The oral form of sore mouth is characterized by sores, scabs and small bumps around the lips and gums of young animals. This disease is most common in sheep and goats. Occasionally lesions will appear in the interdigital space between the toes or on the udder of does or ewes nursing kids or lambs with the disease. Most young animals will eventually recover from the disease but the pain of the sores may stop them from nursing.

Treatment: The young animals must be hand fed or tube fed milk from the mother during this time since nursing is too painful. A soft ointment or petroleum jelly (Vaseline) can be placed on the sores to help them heal and decrease the pain. In Mongolia salted black tea has been used on the sores. This liquid may help to clean and heal the sores.

Prevention:

- A sore mouth vaccine is available in Mongolia and should be used in herds with the disease.
- Isolate affected animals.

This disease is contagious to people and herders must handle the animals carefully to avoid infection. Ideally people should wear gloves when handling the animals.

MASTITIS/UDDER DISEASE (Picture)

The most common type of udder disease is mastitis. Mastitis simply means inflammation of the udder. This inflammation is almost always caused by bacteria. The bacteria enter the udder through the teats and caused an infection. There are also some viruses and fungus that cause mastitis. Udder disease can also be caused by trauma.

Symptoms
Mastitis is usually characterized by swelling, heat and pain of the udder. The milk or udder secretions are usually abnormal. The secretions could be thin and watery, filled with flakes or thick and yellow with a bad smell. At times the milk will appear brown or be mixed with blood. If the mastitis is severe the animal may also show signs of a fever, lack of appetite, and weakness, If the mastitis goes on for a long time the udder may shrink and dry up or become filled with firm masses.

Treatment

One of the most effective treatments for mastitis is to milk out the udder fully and frequently. This will remove the bacteria and other secretions in the infected udder. It the animal is showing other signs of illness make sure that the animal is supported with good quality feed and water. Ask your veterinarian about antibiotic treatments. These may be given through the teat or as an injection in the muscle.

Prevention

- Keep livestock enclosures clean and dry
- Remove dirt from the udder before milking
- Wash your hands before milking
- Milk any livestock with signs of mastitis last to prevent the spread from animal to animal during milking
- Wash your hands after milking an animal with mastitis

CONTAGIOUS AGALACTIA (Picture)

Contagious Agalactia is a disease of small ruminants (goats and sheep) and is caused by a bacterium called *Mycoplasma.*

Symptoms: The disease appears at or shortly after the time that the female gives birth. Signs of the disease include a hot and swollen udder and thick and yellow milk which soon becomes watery and leads to an eventual loss of milk production. Polyarthritis, or the swelling of multiple joints, is often seen. Keratoconjunctivitis or inflammation of the eye is less common but also observed.

Treatment: A vaccine against Agalactia is produced in Mongolia and treatment has been attempted with a 2% lugols iodine solution but the results are variable. Antibiotic treatment of sheep or goats with the disease may decrease the severity of the signs. Ask your veterinarian about these treatments.

Prevention:

- They key to controlling Agalactia in a herd is isolating the sick animals from the unaffected goats or sheep. The goats or sheep with Agalactia should be milked separately.
- If possible the kids and lambs should be separated from the infected does ewes and fed boiled colostrum and milk to prevent transmission of the disease to the kids and lambs.

- Milking adults should be kept separated from the younger goats in the herd to avoid transmission of the disease.
- Have your livestock vaccinated against agalactia if it is a problem in your area.

PINK EYE (Picture)

Pink eye in livestock can be caused by a number of different agents including viruses and bacteria such as mycoplasma and chlamydia.

Symptoms: Pink eye is characterized by red and watery eyes, swelling of the eyelids, squinting to keep the sun out and a cloudiness of the clear part of the eye. Sometimes an ulcer or pit may appear on the surface of the eye. The ulcers can rupture and cause blindness.

Treatment: Many of the lesions will heal in 1-4 weeks if an effort is made to keep the eye covered with a patch or at least keep the animal out of the direct sun and protected from flies. Eye ointments or tetracycline antibiotic treatment can help cure the disease.

Prevention:

- Infected animals should be isolated to reduce spread through the herd.
- Reducing flies by grazing the animals in cooler areas without flies or using a repellant will reduce transmission of the disease.

ABORTION (Picture)

There are many causes of abortion in livestock. There are viral diseases that cause abortion as well as bacterial diseases that cause abortion In addtion to these infectious diseases that cause abortion there are many non-infectoius causes. One of the marjor causes of abortion in livestock in Mongolia is Brucellosis

Symptoms: The signs of abortion vary depending on the period of pregnancy that the abortion occurs. In very early abortions the herder will probably no see any signs of aborted material The female animal will either go back into heat or simply not give birth in the spring. If the abortion occurs later in an animal's pregnancy the herder may see the aborted fetus or the vaginal discharges and placenta associated with the fetus. Abortions often occur at different times of the pregnancy depending on the diseases causing the abortion. There are times that the fetus and related materials show signs of bacterial or fungal infections. Laboratory testing and veterinary assistance is necessary to determine the exact cause of abortion in livestock.

Treatment: The aborting livestock should be isolated from the rest of the herd. If the abortion is caused by a bacterial infection, antibiotics may be helpful in restoring the health of the animal that aborted.

Prevention:

- Isolate the animals that have aborted.
- Burn or bury the aborted fetuses and other tissues.
- Vaccinate livestock for brucellosis.
- Consult your veterinarian about the availability of other vaccines that protect against abortion causing disease.

BRUCELLOSIS (Picture)

Brucellosis is caused by a bacteria called brucella, however, the type of bacteria varies depending on the animal species (sheep, goat, cow, etc.). Cattle, including yaks, sheep, goats and swine are at risk of getting the infection. Brucella infection has also has been reported in domestic animals such as the dog and cat. Brucellosis is a zoonotic disease that means that it can be transmitted from animals to people.

Symptoms: The principal symptom in all animal species is abortion. Illness of young animals is relatively rare. If the pregnant animal becomes infected during pregnancy the result is usually the abortion of the fetus. If the pregnant animal becomes infected late in pregnancy the result may be the full term birth of dead or weak young. The animal will usually not abort the following year but they will remain infected with the disease. Male animals with brucellosis show signs of inflammation of the testicles and seminal vesicles. Some vague symptoms are also associated with brucellosis including mastitis, lameness, swollen joints or slightly loose stool.

Treatment: There is no effective treatment for Brucellosis in livestock. They should be eliminated from the herd by slaughter and used for meat.

Prevention:

- Bury or burn any aborted material. It is believed that the most common route of transmission to other animals in the herd is through the ingestion of the Brucella organism from these materials or from ground contaminated by aborted material.
- Try not to purchase or bring any animals with brucellosis into your herd
- Brucellosis can infect humans. Special care must be taken when handling aborted materials, milk and meat. Herders should protect their hands and arms if assisting an animal in the birthing process and then wash with soap and water immediately after assisting or handling any aborted material. Milk and milk products should be fully boiled and meat thoroughly cooked.

*See more information about this disease in the zoonosis chapter.

VESICULAR DISEASES (Foot and Mouth Disease) (Picture)

There are a group of viral diseases that cause blisters or vesicles in livestock. One of the diseases is Foot and Mouth Disease. The other is Vesicular Stomatitis. There are two more vesicluar diseases that only affect swine called Swine Vesicular Disease and Vesicular Exanthema of Swine. The mucosal form of a virus called Bovine Viral Diarrhea (BVD) will also cause blisters in cattle.

An outbreak of Foot and Mouth Disease occurred in Domgovi Aimag in 1999 and in Sukhbaatar, Dornod, Hentii and Ulaanbaatar in 2001. Foot and Mouth Disease is the vesicular disease that would be most likely to be diagnosed in Mongolia. Due to the recent outbreaks of FMD in the country, herders must be very aware of the signs and symptoms. It is important for herders to recognize these diseases as early as possible to prevent the spread within their own herd and to prevent the spread to other livestock in Mongolia.

Symptoms
The initial signs of vesicular diseases include a fever, fall in milk production and lack of appetite. These signs are followed by the characteristic symptoms of excessive salivation or drooling, clear nasal discharge and some shaking or kicking of the feet and signs of lameness. Vesicles or blisters

then form on the tongue, dental pad, gums, nostrils, muzzle, interdigital space, coronary band and teats. The skin of the tongue or the coronary band may slough. Pregnant cows may abort and young animals may die without showing any signs of disease. FMD affects all cloven hoofed livestock but the signs will vary between species. In Mongolia's outbreaks cattle and camels have been most severely affected and sheep and goats have shown very few signs of the disease, Horses to not get FMD.

*If you see signs of vesicular disease in your livestock you must contact a veterinarian immediately!

Treatment
There are not drugs available to treat viral vesicular diseases. You must support the animals through the period of sore mouths and feet by providing them with food or water. If the vesicular disease in your herd is identified as Foot and Mouth Disease, your veterinarian and the state veterinary service will advise you on what needs to be done. The animals showing signs of the disease are often killed to reduce the spread of the infection.

Prevention
There are vaccines available against vesicular diseases. The vesicular disease of greatest concern in Mongolia is Foot and Mouth Disease. If your livestock are in an area where an outbreak has occurred or close to a potential point of infection, state veterinary services will recommend vaccination of your herd.

- Have your livestock vaccinated with the recommended vaccine
- Adhere to quarantines
- Avoid quarantined areas
- Separate you healthy animals from those showing signs of disease

LAMENESS (Picture)

Lameness in livestock can be caused both by infectious and non-infectious agents. Infectious lameness is often called foot rot and is caused by the invasion of different bacteria into the hoof Foot rot is most common in small ruminants but hoof problems caused by bacteria can also be seen in large livestock. A more common cause of lameness in Mongolia is damage to the lower legs and feet caused by snow and ice. Viral diseases can also cause lameness in livestock. Remember that viral diseases like Foot and Mouth Disease will cause vesicles and blisters of the hoof and the animals will show signs of lameness.

Symptoms: Small ruminants with foot rot will show signs of lameness and their hooves will appear soft and rotten and have a bad odor. Wounds on the legs will appear as red and irritated areas and the hair around the coronary band may fall out.

Treatment: Foot rot is treated by removing the dead tissue of the hoof with a sharp knife until healthy tissue is found. Livestock can then be made to walk through a disinfectant like copper sulfate or a 2-5% formalin solution. Wounds on the legs should be cleaned with warm water and soap and then irrigated with a salt solution. The wounds can be wiped with cotton wool soaked in alcohol and then disinfected with an iodine solution.

Prevention:
- Move livestock from contaminated enclosures for a period of 4 weeks if foot rot appears in the herd.

- Try to graze livestock with wounds and abrasions in areas where they will not be further aggravated by sharp ice or snow.
- Keep enclosures dry and clean.

NON-INFECTIOUS DISEASES

GASTROINTESTINAL DISFUNCTION (Picture)

Gastrointestinal disfunction includes **rumen bloat, impaction, choke, acidosis** and **indigestion**. Gastrointestinal dysfunction is usually related to changes in feed or feeding conditions.

Symptoms: Rumen bloat is caused by an abnormal accumulation of gas in the rumen and is characterized by pain, discomfort, difficulty breathing and an obvious fullness of the left flank that sounds like a drum when thumped. Impaction can be caused by the consumption of poor quality forage that is difficult to break down. Feed will become stuck in the rumen or stomach and normal motility will cease. Choke is the result of feed being stuck in the esophagus. The animal will regurgitate feed and the obstruction can often be palpated in the neck. Acidosis and indigestion are the result of a change of pH in the rumen or stomach. The animal eating too much grain or other kinds of feed with a high amount of starch or sugar often causes this. Depending on the severity of the case the animal may lose its appetite, grind its teeth, develop diarrhea and become severely dehydrated.

Treatment: A animal with **rumen bloat** should be encouraged to get up and move around. A piece of wood can be tied in the mouth to stimulate salivation. A tube can be passed down the esophagus to help relieve the gas and if that does not work it may be necessary to place a trocar or large needle through the body wall into the rumen to relieve the gas. The trocar should be placed in the most prominent portion of the left flank. **Impaction** can sometimes be corrected with the administration of fluids (water) or mineral or vegetable oil given orally. Severe **impaction,** however, might require a rumenotomy that must be done by a veterinarian. **Choke** can often be corrected by passing a tube into the esophagus and gently pushing the obstruction into the rumen or stomach. **Acidosis and indigestion** can often be treated with oral administration of a mixture of charcoal and sodium bicarbonate and some vegetable oil. A mild laxative like magnesium sulfate may also be helpful. A mixture of water, ash and wood coal can replace the charcoal bicarbonate and a greasy meat broth can replace the use of vegetable oil.

Prevention:
- Provide livestock with good quality pasture and forage.
- Do not make sudden changes in the feed available to the herd.

INTOXICATION (Picture)

Chemicals, toxic plants and spoiled forages all have the potential to cause intoxication in livestock.

Symptoms: The symptoms of intoxication will vary depending on the intoxicant and the amount the animal ingested or was exposed to. In general intoxicants will affect the gastrointestinal system, the nervous system or the renal and cardiac system. General signs include increased salivation, vomiting, diarrhea, respiratory and circulatory disturbances and abnormal behavior.

Treatment: Appropriate treatment will depend on the type of toxin that was ingested or to which the animal became exposed. If a toxin has been ingested you want to clear it from the system either by passing a tube through the esophagus and lavaging the stomach (getting the contents out) or by

surgically performing a rumenotomy and emptying the rumen contents. The toxin can sometimes be absorbed by placing charcoal mixed with water in the stomach through a tube. Sour milk can also be used to neutralize some types , of toxins. If the animal has been exposed to a toxin through contact on the outside of the body if will be helpful to attempt to clean the animal thoroughly with water and soap to get the chemical off the hair.

Prevention:

- Do not graze livestock in pasture known to contain toxic plants
- Check forage for moldy areas before feeding to livestock.
- Do not allow livestock access water know to be contaminated with chemicals.
- Use dipping and other insecticide-like materials in a well-ventilated area and as directed by the label or your veterinarians.

PARASITIC DISEASES

Diseases caused by parasites are infectious diseases but they are often thought of differently. The word "parasite" means an organism that lives upon another organism. Parasites are live organisms that live and feed on or within another animal's body. The parasite usually feeds on its host (livestock in this case) without actually letting it die. Although parasites are much smaller and weaker than the host animal, they cause significant annoyance and damage to it. By dwelling on or inside the animal's body parasites can cause damage to internal organs, provoke an allergic reaction or generally weaken the livestock. We usually think of parasites as either internal or external parasites. Internal parasites are mainly worms and one celled parasites that live within the host. External parasites are mainly insects that live on the skin of the host. All parasites, both internal and external, will weaken livestock and make them less able to fight other infectious diseases and survive harsh weather conditions.

INTERNAL PARASITES

Blood Parasites

Parasites of the blood are very small and can only be seen by examining the blood of an infected animal under a microscope. The two most common blood parasites found in Mongolia are Babesia and Trypanosoma. Babesia parasites are generally transmitted to livestock through the bite of a tick. Trypanosoma parasites are generally transmitted to horses and camels through the bite of a fly.

(Life Cycle Diagram) **Parasite 1**

Symptoms

Acute signs of disease of blood parasites usually last 1-4 weeks. The animals have fevers, a lack of appetite, increased respiratory rate, anemia, jaundice and weight loss. Some types of blood parasites will only cause a mild anemia, weakness and weight loss. The severity of the disease caused by the parasite is usually related to the overall status of the animal. An animal that is well fed and otherwise healthy will not be as severely affected by blood parasites.

Treatment

There are some drugs for blood parasites but they are difficult to find and not very effective. Before treatment with special drugs, the blood of the sick animal should be examined by a veterinarian in a laboratory.

Prevention

- Ensure that your livestock receive adequate nutrition and have access to good quality pasture
- Take measures to prevent exposure of your livestock to ticks and flies (See "parasite control" below)

Gastrointestinal Parasites

There are both worms (helminths) and one-celled organisms (protozoa) that parasitize the intestinal tract of livestock. Both worms and one-celled parasites of the intestinal tract cause diarrhea, weight loss and general poor health of your livestock Intestinal parasite transmission is most common when the weather is warm and wet because the eggs of the parasites are shed in the dung which then infects the pasture. In Mongolia internal parasite transmission is probably most common in the summer months.

(Nematode Life Cycle)
(Protozoan Parasite Life Cycle—coccidia)

Symptoms
Signs of disease caused by intestinal parasites include diarrhea, weight loss and loss of an interest in feed. Internal parasites can also cause blood loss and loss of protein which results in pale mucous membranes and edema (fluid collecting under jaw). Livestock with large numbers of intestinal parasites usually do not grow well and have rough hair coats or wool break.

Treatment: Livestock should be treated with an anthelmentic (drug for internal parasites) when suffering from internal parasites. This treatment is especially important for young livestock suffering from internal parasites. An effort should be made to identify the type of parasite the goat is infected with by analyzing the feces. Your veterinarian can perform this test. Anthelmentics available in Mongolia include Levamisol, Albendasol (Vermal and Vermatin)and avermectin. These are all very effective against nematode or worm parasites.

The treatment for the one-celled or protozoan parasites is different. The most common one-celled parasite of livestock is coccidia. The drugs that effectively treat coccidia are called amprolium and sulfamethazine. Please see your veterinarian about these treatments. They should be used to treat parasite infections as well as prevent them as outlined below.

Prevention:
The Timing of Parasite Prevention if Very Important!

- All livestock in the herd should be treated right before the summer months for internal parasites. This will eliminate the parasites within the body and therefore reduce the passing of eggs in the feces. This will reduce the contamination of the pasture during the warm, rainy months when transmission is highest.
- Treatment for internal parasites should be repeated in the late fall to kill the parasites before they become arrested (or spend the winter) in the livestock's body.
- Efforts should be made to keep livestock pens clean and dry. This will decrease the number of parasites in the environment.
- The density of livestock per pen, especially with young livestock, should be kept to a minimum. This will also reduce the parasites in the environment.
- It is more important to treat young livestock for internal parasites than it is to treat adults. Adult livestock will be able to fight parasites on their own as they grow older.

Brain Parasites

The most common brain parasite of livestock in Mongolia is a tapeworm parasite called *taenia multiceps.* The disease this parasite causes is called coenurosis. The intermediate stage of the tapeworm or metacestode grows in the brain of small ruminants and sometimes calves causing disease. The adult tapeworm is found in the intestine of dogs or other carnivores. The disease causes significant losses to herders because it is impossible to treat effectively.

(Coenurosis Life Cycle)
Life Cycle

- The adult tapeworm parasite lives the small intestine of carnivores including the domestic dog.
- The rear segments of the adult tapeworm become separated and are expelled in the dog's feces.
- The segments are full of eggs that contaminate the pasture.
- Domestic ruminants ingest the eggs when they are grazing on pasture or drinking from contaminated water sources.
- The eggs ingested with the grass, penetrate the intestine and migrate through the blood vessels to all parts of the body.
- Those eggs that reach the brain develop into metacestode cysts growing in size every day.
- The life cycle is completed when the dog eats the brain of the goat or sheep infected with a metacestode cyst.
- The larvae within the cyst then grow into adult tapeworms within the intestine of the dog or other carnivore.
- The cycle continues as the adult tapeworms produce more eggs and pass the egg-fill segments in their feces.

Symptoms
The signs of coenurosis are associated with the presence of the metacestode or tapeworm cysts in the brain. The specific signs are dependent on which part of the brain is infected with the cyst. The sings include periods of abnormal head carriage, depression, short episodes of convulsions and intermittent circling. These signs progress to a constant head tilt, blindness (one-sided), loss of balance, staggering, and constant circling. In the final stages the animals are unable to stand, have rigid muscles and are often constantly paddling. Death follows. The herder can often feel a soft area in the skull of the animal where the bone has become very thin over the cyst.

Treatment
There are no known effective drug (anthelmentic) treatments of the animals showing signs of disease. If the bone is very soft at the site of the cyst sometimes the contents of the cyst can be aspirated through a needle followed by the introduction of a mild antiseptic. Surgery to remove the cyst is possible but not without risk. The key to controlling this disease is prevention.

Prevention
Break the Life Cycle!

- Do not feed dogs the brains or heads of affected livestock.
- Keep your livestock away from areas that you believe to be contaminated with the feces of dogs and wild carnivores

Eliminate the Parasite!

- Treat your dogs with a drug that will kill the tapeworm parasite
- Ask you veterinarian about effective dewormers.
- Arecolin is a drug that purges the dogs intestine

- Praziquantel is a drug that kills the adult tape worms

EXTERNAL PARASITES

External parasites are parasites that live at least a part of their life on the outside of their host in the skin, wool, hair or nasal passages. External parasites can cause damage to hides, a decrease in wool or hair production and general irritation. External parasites, like internal parasites, can decrease weight gain and production levels in livestock.

External parasites are generally insects. They are also very small but some can be seen with the human eye.

Fly Larvae

The larvae of various flies can inhabit the nasal cavities, esophagus, stomach and skin of livestock. The larvae of the flies enter the livestock through the skin, nose or oral cavity after the adult fly has laid its eggs on the livestock's outer hair The larvae spend the winter months inside the tissues of the livestock. In the spring when the soil thaws and it becomes warmer, the larvae leave the livestock and finish their growth in the soil, emerging as flies. The flies then spread their eggs. The eggs again infect livestock and the cycle continues. Three examples of fly larvae infection are given below.

Hypoderma of Cattle
(Life Cycle)
The bot fly larvae migrate through the flesh and cause a reduction in weight and a decrease in the value of hides. The third stage of the larvae emerge along the back of the cattle. They can be seen in the spring and summer.

Sheep Nasal Bot Fly
(Life Cycle)
Adult flies lay their eggs near the nose of the sheep. The larvae then migrate up the nose and can grow to the size of 15 cm The signs in the sheep are nasal discharge and difficulty breathing The adult flies can also irritate the sheep and lead to decreases in production.

Horse Bot Fly/Stomach Larvae
(Life Cycle)
The adult fly lays its yellow eggs on the hair of the horses legs and face. These can be seen in the summer time if you look closely The horse then ingests the eggs when it bites at its legs. The larvae grow in the horse's stomach and are passed out in the feces in the spring. The larvae in horses do not cause any major harm but the adult flies can irritate the horses. At times a heavy infestation with bot larvae will lead to ulceration and perforation of the horse's stomach wall.

Treatment/Prevention

- Avermectin or Ivermectin given at a dose of 0.2mg/kg will kill the larvae of the flies once they have entered the tissues of the livestock
- Livestock should be treated for fly larvae parasites with avermectin or ivermectin in the fall. This will kill the larvae form and they will not grow and cause damage
- Fly prevention is important. Livestock can be dipped or treated with pour on organophosphates

Mange Mites

(Life Cycle)
There are a number of mite parasites that cause mange in livestock. Mange is characterized by hair loss and scratching. Mange mites can do damage to hides and cause generalized decreases in production. The mite parasite is too small to be seen with the human eye but is visible under a low powered microscope. The different kinds of mites cause slightly different signs of disease in livestock.

Mange caused by Psoroptes species results in weight loss and hair loss. The livestock will bite and scratch. Psoroptic mange is very contagious and has been linked to decreases in production. The hair loss and weight loss caused by psoroptic mange contributes to the livestock's susceptibility to winter weather.

Mange caused by Sarcoptes species causes intense itching and is also very contagious. The mange and hair loss starts at the head and shoulders and can spread to the entire body. Crusts form on the skin and the skin often gets very think and forms large folds.

Mange caused by Chorioptes species is usually limited to the legs. It may sometimes spread to the udder, scrotum, tail and perineal area.

Mange caused by Demotectes species causes damage to the skin but is not itchy. Goats with demodectic mange usually have small nodules that develop all over their body. The nodules are filled with grayish material containing the parasitic mites.

Treatment/Prevention

- Two treatments with ivermectin at a dose of 0.2 mg/kg at a three-week interval is effective
- Spay-dipping for mange can also be effective. Consult your veterinarian about treatment options
- Treat all livestock with mange at the same time
- Do not purchase or bring any livestock with signs of mange into your herd
- Isolate livestock showing signs of mange from healthy livestock until treated and cured. At least 2-weeks after treatment

Lice

Lice are small (2-4 mm) insect parasites that spend their entire lifecycle on the body of the host. The eggs, nymphs and adult lice are visible in the hair and skin of infected animals. This parasite inhabits the livestock all year round if they are not treated. Lice infestations are most common during the winter months. Most species of lice are host specific. That means that the lice of the cow will not infect sheep or goats.

Lice feed on blood, superficial skin, peeling skin particles and clotted blood. Lice will cause skin irritation, a general unhealthy appearance with a rough hair coat and lowered production. Nine species of blue lice and five species of yellow lice are common in Mongolia. Yellow lice are also known as chewing lice. They chew on the skin of livestock making the animals restless Livestock infected with yellow lice will rub themselves against fences and walls They will loose hair and their skin becomes inflamed. Blue lice are also known as biting or sucking lice. They puncture the animal's skin and excrete poisonous saliva that causes itching. If the infestation with biting lice is

severe it can cause significant blood loss. Animals can also develop sores from all of the scratching. These sores can sometimes resemble mange.

Treatment/Prevention

- Livestock should be dipped or sprayed with a dipping solution approved for use in livestock. Consult your veterinarian for the appropriate dose and solution.
- All livestock should be treated at the same time so that untreated animals will not transmit the lice to treated animals
- Two treatments should be performed approximately 2-weeks apart so that all of the adult and immature lice are killed
- Dipping can not be done in the winter time. In the winter an insecticide dust can be applied two times two weeks apart. Always treat the whole herd.
- Injectable avermectin can be used to treat biting or sucking (blue) lice. The dose is 0.2 mg/kg.
- Pour-on preparations for lice treatment may be available in Mongolia in the future

Ticks

Ticks are large external parasites. They puncture the animal's skin and suck blood. There are two major classes of ticks, the hard ticks and the soft ticks. Some kinds of ticks spend their whole life cycle (egg, larva, nymph and adult) on one host and others switch from one host to another with each developmental change. The ticks excrete a cement- like substance from their saliva glands when they attach to a host. This "cement" can cause damage to the skin and hide. After sucking blood the tick falls off, however, the animal's skin is often permanently damaged. General decreases in body condition and production may be seen with tick infestations.

Treatment/Control

Avoid Areas with Ticks

- Use open windy pastures with scarce vegetation during the tick outbreak period
- Do not let animals lie down at the hottest time of the day
- Move animals to higher alpine pastures during the tick outbreaks
- Cut the horse and cattle coat before tick outbreak season Kill Ticks
- Dipping and spraying with insecticide solutions. See your veterinarian for advice about instructions for use
- Pour on preparations like 5% Byticol can be poured along the back

Task 3.

Compile a miniature book about the above mentioned parasites. This book will be put in the Education center of the soum and used by herders.

Use the following hints.

When writing about these parasites and the damage they cause to livestock, use books, pictures, other published data and ideas from radio lessons.

Third Chapter

Zoonoses (Animal diseases that can be transmitted to humans)

The purpose of the chapter:

To become familiar with some zoonotic diseases that are common in Mongolia. To be able to identify the signs of zoonotic diseases in animals as well as humans. To provide some tips on preventing zoonotic diseases.

By the end of studying the chapter you will learn:

- About zoonoses;
- Human signs of the disease;
- The signs of the disease in animals;
- Helpful hints for prevention of those diseases;

General part

Zoonoses are infectious and parasitic diseases that can be transmitted from animals to humans and that are sometimes transmitted from humans to animals. Zoonoses can be divided into four groups depending on the cause. The four groups are bacterial, viral, parasitic and fungal. When you study the particular disease note what group the disease belongs to.

Brucellosis

What is Brucellosis?
Brucellosis is a disease that causes illness both in humans and animals. The disease is transmitted from animals to humans and is called a zoonotic or human and animal disease. The disease is caused by brncelia bacteria, however, the type of bacteria varies depending on the animal species (sheep, goat, cow, etc.). There is no transmission between humans.

Why is the disease dangerous?
Human brucellosis causes debilitating illness in humans. Livestock brucellosis causes decreases in animal production, the birth of weak newborn animals or abortion and it has negative effects on livestock reproduction.

How do people get the disease?
Transmission to human happens in a number of different ways. The bacteria can enter through skin abrasions, by ingestion and by the inhalation of aerosol particles containing infectious agent. There is a high risk of getting infection when people consume raw or under cooked animal products such as raw milk and other non-pasturized dairy products. Eating under cooked meat serve as one of the source of infection as well. There is also a very high risk of herders getting the infection during the kidding, lambing and calving season. When herders are handling newborn animals, the placenta, afterbirth, or mucus or aborted fetuses without protection the bacteria can enter through cuts in their hands or other abrasions. The infection through air is rare, however it might happen when people nhale the aerosol particle with bacteria when collecting and classifying the animal hide, wool and cashmere.

How do animlslget infected with the disease?
The bacteria can enter through animal digestive organ. This way of infection ransmission happens by ingestion of contaminated pasture, fodder or water. Cow's habit f licking newborn calves and afterbirth is an important source of infection issemination.Inseminating infected semen during the artificial insemination might serve the transmission of infection as well.Keeping the infected animals with healthy animals might serve an air route of ransmission of infection. Picture

What are the symptoms of the disease in humans?
Fever with chili, general malaise, sweating, pain in joints, weakness, fatigue, pain in body are the signs of acute case, In some people the signs are weak which resembles chronic form of the disease. Chronic form often causes the relapse, with elevation of temperature, weakness, depression, pain in right and left flanks, joint pain etc. When the disease gets to the chronic stage, the formation of joint deformation followed by limitation of joint movement occurs, which debilitates the person.

What symptoms occur in animals?
The principal symptom in all animal species is abortion. Illness of young animals is relatively rare, if the pregnant animal was to be infected the premature expulsion of the fetus in 4-5 months of pregnancy or full term birth of dead or weak kids will be observed. If the male breeding animal infected, the inflammation of the testicles and seminal vesicles are predominant symptom. The disease may progress leading to infertility.

Tips

People need to make their habit, to consume livestock products such as meat, milk and dairy products when they are well cooked or boiled. The herders need to be careful during the kidding using the protective clothes and gloves when handling kids, placenta, fetus or afterbirth. You have to be careful during slaughtering season, because infection can transfer through damaged skin, like finger cut.

Get your herd tested for brucellosis regularly. If your animal is diagnosed as infected, the measures such as isolation of healthy herd from the infected, culling of infected and vaccinating of healthy animals should take place in your herd with professional help.

Warning

If you see the human signs in yourself you should seek professional help. The test for diagnosing should be done urgently and if test is positive, the treatment should be started as soon as possible.

Task-1
What measures should take place to prevent brucellosis? Let's put the tips together. Fill the blank spaces.
In order not to get the infection, man first needs to get ... checked.
The infected animals needs to be..... The infected animal product should be..... before consuming. During the kidding and slaughtering the herder should put on..... gloves.
Use the following hints.

1. Brucellosis transmits from animal to human through digestive organs and skin cover.
2. The infection can be transmitted through milk, meat, and young animal that was to born from infected female, placenta and hides.

Task 2
What would you think and what kind of measures would you take when your animal aborts or gives birth of weak newborn animals?

- Use the following ideas.
- The abortion and birth of weak newborn animals can be the sign of brucellosis.
- Separation of healthy and ill animals.
- Careful handling infected animal's newborn kids, placenta.

Task3
What measures need to take place if you cut the finger during slaughtering? Use the following hints:
There is a high risk getting infection from infected animal's blood, meat as well as hide through damaged skin.

2.2 Anthrax

What is anthrax?
Anthrax is a zoonotic disease or one that is transmitted from animals to humans. It is caused by bacteria. Both small and large livestock are likely to get sick with the disease.

How is the disease transmitted?
Anthrax bacteria can live in the environment, mainly soil, for months and years. It turns into an active form after entering the animal body with hay and fodder from the pasture. Because of this there are areas of the country that are natural foci for infection or where the disease is often present. The bacteria reproduces in number when it enters animal's blood worsening the disease. People get the infection by being in direct contact with sick animals or by handling dead animal carcasses. Transmission between human beings rarely occurs.

What is the disease like in humans?

The first signs appear 3-5 days after getting the infection. There are three clinical forms: cutaneous (skin), respiratory, and gastrointestinal.

The cutaneous or skin form occurs in the skin where the anthrax enters. First a papule or raised bump appears on the skin and later it turns into a vesicle (blister) and bloody lesion. The lesion is not painful which is characteristic of cutaneous anthrax. Direct contact with the infected animals or contact with contaminated animal wool, hide or carcasses can cause this from of the disease.

Gastrointestinal anthrax is contracted by the ingestion of meat or a meat products made from infected animals. The signs include vomiting and bloody stool.

Pulmonary or respiratory transmission of the disease occurs when the person breathes in particles with the anthrax bacteria. The signs include fever and difficulty in breathing. This form complicates easily and is very serious. All three forms are often cause complications and can be lethal.

What are the signs in livestock?

Anthrax in livestock is characterized by acute, subacute and chronic disease but the acute form predominates.

In sheep, goats and cattle the symptoms come on suddenly and progress rapidly The animal will have a very high body temperature Staggering, difficulty breathing, trembling, collapse, convulsions and then death can be seen in previously healthy livestock.

The subacute form starts with fever and excitement followed by depression As the disease progresses limited movement, difficulty in breathing, and convulsions will develop and eventually they lead to death. This form is common in cattle, sheep, and horse

The main symptom of the chronic form is swelling of the throat area and sometimes the entire neck and shoulders

A characteristic sign of anthrax is dark unclotted blood at the mouth, nostrils and anus of an animal that has died of the disease.

1. Warning

If you suspect anthrax, emergency measures need to be taken The animals with clinical signs need to be isolated. You may want to treat your remaining livestock with penicillin. You need to call your local veterinarian immediately.

General Precautions

- Avoid being in direct contact with animal carcasses or animal products when anthrax is suspected
- Never open the carcasses of animals that may have died from anthrax
- Get medical care quickly if signs of disease are seen in humans
- Livestock carcasses should be buried deeply in a hole of at least 2 meters and burned
- Bedding and other contaminated materials should be burned and buried deeply
- Quarantine for two weeks should take place in affected herd area, no animals and
- animal products should be allowed out.
- Personal and environmental hygiene in outbreak site should take place;

Prevention of the Disease

- Get all of your livestock vaccinated against anthrax regularly
- Avoid pastures or grazing areas known to be associated with anthrax outbreaks
- Adhere to quarantine measures set up to stop the spread of disease

Task 4

What disease would you suspect, if the symptom of excitement followed by depression, difficulty in breathing and convulsion?

Your guess

Brucellosis
Anthrax
What you should do urn
Injection with Penicillin
Give water

Isolation

Take off dead animal hide
Bum the dead animal carcass in 2 meter depth hole

2.3 Rabies

What is rabies?

Rabies is caused by a virus. Rabies virus can infect all mammals and cause disease. It is usually transmitted from animal to animal and from animal to human through a bite. The virus affects the neural system, therefore the disease causes changes in behavior and abnormal signs.

How is the disease transmitted?
The disease is transmitted from infected animals and livestock to humans. Transmission occurs when the human comes into contact with an infected animal's saliva. The saliva enters through damaged skin. The most common mode of transmission is through a bite. The infected animals will bite a human and the virus is transmitted with its saliva into human tissues. Rabies tends to be present in wild animal populations and they are the source of the infection for domestic animals. Humans most commonly get the infection from domestic animals. Transmission between humans has not been reported. The wild animals in Mongolia most likely to have the disease are the fox and wolf. The domestic animals most likely to contract the disease are the cat and dog, however, all livestock (cattle, sheep, goats, camels and horses) can contract the disease and can potentially infect humans through contact with their saliva.

What are the symptoms in humans?
Signs in human generally appear 2 to 8 weeks after they have become infected with the rabies virus. The timing of the signs depends on how much virus entered the human and where in the body the bit was located. The closer the bite is to the central nervous system and the greater the amount of virus the sooner the signs of disease appear.

The signs of the disease usually begin with an increase in body temperature, a headache, a feeling of anxiety and general malaise. The person experiences changes in skin sensation especially at the site of the bite and may feel as if insects are crawling over their skin. The excitatory phase follows with the person becoming extremely sensitive to light and sound with a dilation of the pupils and an increase in salivation. As the disease get worse the person will have trouble swallowing and the muscles of the throat will spasm. The person may become aggressive and try to hit other individuals. There may be spasms of the respiratory muscles and generalized convulsions. This phase will continue until death or the person will experience a general paralysis (no movement) and die soon after. Once signs are seen the disease usually only lasts 2-6 days. The disease is almost always fatal.

What are the signs in domestic dogs?
(cats are similar)
Dogs infected with rabies will behave abnormally. They may be agitated, walk around restlessly, or hide in dark corners. There may be a slight increase in body temperature, irritation at the site of a bite and lack of appetite. Over 1-3 days the abnormal behaviors get more severe and the dog becomes very aggressive and often bites at objects, humans or other animals. The sound of the dog's bark or voice will also change to a long howl. In the final stages of the disease the dogs have convulsions and become incoordinated or paralyzed. Sometime the aggressive form is very short and the paralysis form is longer. The disease usually lasts from 1-11 days. The dogs will die if infected with rabies.

What are the signs in domestic livestock?
Signs in cattle, horses, sheep and goats also begin with generalized abnormal behavior. The livestock will first separate themselves from the herd. Their pupils may be dilated or the hair might stand upright. The livestock will be unresponsive and depressed. The aggression form is rarely seen

in domestic livestock. There may be some muscle spasms or excitement but rarely more. The area of the bite may be very sensitive and painful. The infected animal may scratch at the bite to the point of causing a sore. As the disease gets worse the livestock become uncoordinated, have difficulty swallowing, may be constipated and experience contractions of the muscles of the neck and extremities. Finally they can not get up and die of inability to breath.

What can the herder do to prevent rabies in their animals and livestock?

- Vaccinate your domestic dogs against rabies. This vaccine is available in Mongolia.
- Protect your livestock from wild wolves and foxes that are showing signs of disease.

What can the herder do to protect himself or herself from rabies?

- If you have bitten by an animal, especially one you suspect to be infected with rabies, the area needs to be cleaned promptly with soap and water. Call or travel to the closest medical service and receive post exposure vaccination under the care of a doctor.
- Isolate the suspected animal immediately and call your local veterinarian
- Do not slaughter the suspected animal for meat purposes
- Do not touch the carcass of the animal that has died
- Do not use for any purposes the products of an animal that is suspected to have died
- of rabies
- Burn and bury the animal carcass.

Task 5

Match the name and sign of the disease.

Anthrax	Headache, changed skin sensation, being not peaceful, sleep with nightmares
Brucellosis	Pain in right and left flank, arthralgia
Rabies	Skin legion with vesicles and progresses developing skin abrasions. However, the skin lesion has no pain.

Task 6

What would you do before doctor's arrival, if your friend has been bitten by sick dog?

2.4 Plague

Plague is a bacterial disease spread by the flea of marmots and other small rodents. Fleas are very small insects that live in the fur of marmots and other rodents like rabbits and mice The marmots or rodents usually do not show any signs of disease. Humans become infected when they are bitten by the marmot or rodent flea that carries the bacteria. The bacteria can live in the soil or the rodents' living areas for years. There are specific parts of the country that experience plague outbreaks every year.

What are the signs of disease in wild rodents?

The disease in rodents can be either acute or chronic It is possible for a rodent to be infected with the plague bacteria and show no signs of disease. Any rodent showing abnormal behavior or obviously sick in a plague area should be suspected as carrying the disease. Finding many dead rodents in one area may also indicate a plague outbreak.

What are the signs in man?

The signs of disease will be seen hours or days after the bacteria enters the person, usually through the bite of a flea. The disease has three forms, the bubonic, pulmonary and disseminated forms. General signs include an elevated temperature, chills, headaches and vomiting. Forty-eight hours you will see signs of the specific form.

The bubonic form is most common and is characterized by swelling and pain of peripheral lymph nodes. The disease may result in the swelling of lymph node with purulent discharge. Sometimes the disease progresses without inflammation and leads to death.

The pneumonic form is associated with signs of pneumonia, a cough, and bloody discharge from the mouth. Death follows rapidly.

The disseminated form is associated with signs of brain and nervous system disease. The disease develops very rapidly and leads to death.

What can the herder do to avoid getting plague?

- Do not hunt marmot or wild rodents in areas where the disease is present;
- People who live near to natural foci and work with wild rodents should be vaccinated against plague regularly;
- If you see signs of plague seek medical help immediately. It can be treated successfully with the right antibiotics;
- Be careful not to damage your skin when handling marmots;
- Cook marmot meat thoroughly before eating;

Task 7
Make conclusion from the point that anthrax transmits from animal to man, but not from man to man. Plague transmits either from animal to human or from human to human.

Task 8
What is the reason of plague outbreak every year in Mongolia? What season its outbreak mostly tends to take place?

Use the following hints:

1. The causes of zoonotic diseases are different. Knowing the signs of each disease and transmission routes helps to prevent the disease outbreak in animal population and protects human from disease.
2. Do not hunt the rodents in plague outbreak area. People should get vaccinated against plague.

Salmonellosis

What is salmonellosis?

Salmonellosis is an infectious bacterial disease that :.auses illness in both humans and animals. The illness is of the gastrointestinal tract. Some animals and people will not show signs of the disease but they may still be infected and capable of transferring the disease to others

What is the source of the disease?

The original source of salmonella bacteria is feces because the bacteria grows in the intestinal tract of both humans and animals. Animal and human feces can contaminate the environment or food and livestock products. A human can become infected through direct contact with a sick person or animals or by eating food contaminated with the bacteria. Eating contaminated meat, dairy products or eggs that are contaminated with salmonella bacteria is a common way of transmitting the disease. Half processed food like sausage can also be a source of salmonellosis causing bacteria. Contaminated food often does not show any change in color, smell or taste,

What are the sigtis in humans?

A few hours after consuming food contaminated with salmonella bacteria the person will experience feelings of nausea. Vomiting, abdominal pain and watery diarrhea with blood often follows. General symptoms like fever with chills, massive sweating, muscle pain and headache may also be experienced. The person becomes dehydrated quickly because of the vomiting and diarrhea. Salmonellosis cannot be distinguished from other intestinal diseases without laboratory testing. After recovery the person will shed bacteria for weeks and serves as source of infection for other people. The infection can occur in humans of any age group but young children and the elderly are most likeiy to become infected.

What are the signs in animals?

General signs of salmonellosis in livestock include an elevated temperature, a decreased appetite, weakness and diarrhea with blot clots.

Swine are most susceptible to salmonellosis infection. The disease in swine is characterized by a decreased appetite, 40-41 C fever, and in some cases diarrhea with blood clots. In young pigs it may progress and lead to death in 3-4 days. Recovered pigs will shed salmonella bacteria for the rest of their lives.

Both young and adult large ruminants will get sick with salmonellosis. The young usually show signs of the disease one month after birth. The sick animals are weak and shows signs of fever, heavy breathing and diarrhea with blood clots. In some cases the bacteria may enter the young animal's blood and cause infections in joints or the umbilicus. In adult ruminants the disease will result in an intestinal infection with decreased appetite, weakness and blood clots in feces.

Salmonellosis in horse causes abortion, fever, hard breathing and diarrhea.

Sheep experience the general signs of diarrhea and weakness in addition to abortion in the last 50 days of pregnancy.

Goats are different from other species in that they do not show signs of bloody diarrhea. Newborn goats can become infected and die very quickly or slightly older goats will come down with diarrhea and become dehydrated. Some goats will recover and others will die of the disease.

Cats and dogs are at high risk of getting the infection because they often eat contaminated food.

Salmonellosis in the poultry industry spreads rapidly and causes a great economic loss.

How can the herder avoid getting Salmonellosis?

- Follow basic rules of hygine. Always wash your hands after handling animals and before preparing or eating food.
- Cook and boil meat and milk thoroughly before consuming.

- Do not eat raw eggs
- Cook half processed food products before consuming.
- Refrigerate or keep cool eggs and other food products that will spoil.
- Seek medical help and hospitalization for humans showing signs of Salmonellosis.
- A sick person's feces should be discarded and promptly disinfected with chlorine solution.
- Following simple disinfection and sanitary measures will have a great impact on the decrease of disease incidence.

Task 9

Tell about Salmonella infection to your family following the order below.

- The cause of the disease
- The source and transmission of infection
- The signs in human
- The prevention

Echinococcosis

What is echinococcosis?

Echinococcosis is caused by a tapeworm parasite. The parasite usually only infects canines (dogs, wolves, fox) and ruminants (sheep, goats, cattle), however it can infect people. The intermediate stage of the parasite will form a cyst in the abdominal organs and sometimes other parts of the human body if a person becomes infected with the eggs of the parasite.

How is the disease transmitted?

It is important to understand the life cycle of the echinococcus tape worm parasite to understand how it is transmitted from cainines to ruminants and how it is transmitted to people.

Life Cycle Drawing

The definitive host of the echinococcus tapeworm is the dog or wild canine. This means that the adult tapeworm lives in the small intestine of the dog or wild canine. The adult echinococcus tapeworm is very small and cannot be seen easily. The tapeworm releases eggs that are passed out with the dog's feces. The feces mixed with the eggs contaminate the pasture, drinking water and fodder of livestock. Livestock then ingest the eggs as they graze or drink. The livestock become what we call the intermediate host because the intermediate or larval stage of the parasite grows within them. Sheep, goats, swine, cattle and horses can be intermediate hosts. The intermediate host ingests the eggs from the pasture, the eggs hatch in the intermediate host's intestine and penetrate the intestinal wall and migrate through the blood circulation to various organs (liver, lungs) and form a cyst. The cyst includes large numbers of larva inside. When the livestock are slaughtered the cysts in the organs are often fed purposefully or accidentally to the dogs. The dog eats the cyst containing organs and the larva (intermediate stage) enters the small intestine of the dog, where it grows and develops into adult tapeworm. The adult tapeworm begins to release eggs and the cycle continues.

Haw do humans become infected with the echinococcus tapeworm?

Remember the eggs that are released in the dog's feces? These eggs can also be ingested by humans if their food or water sources are contaminated with the echinoccocus eggs. It is also possible that the eggs are present in the dog's fur or the environment. They eggs can contaminate peoples' or

children's hands and are ingested when eating other food or when putting the hands in the mouth. The intermediate stage of the parasite will then grow in the organs of the people. A cyst containing many larvae will grow in the infected person's internal organs causing disease.

Picture

What are the signs in animals?

Large and small ruminants, swine and horses can become intermediate hosts of the echinococcus parasite. The cyst develops mainly in the animal's liver and lungs. The cyst contains fluid and will grow to a large size. The signs that the herder sees in the livestock will be dependent on where in the body the cyst is located. If the cyst is growing in the lungs the animal will have difficulty breathing, will cough and may loose body weight. If the cyst is in the liver the animal may show signs of liver disease with the tissues turning yellow and a decrease in appetite and strength. No matter where in the body the cyst is it will cause a decrease in the productivity and overall health of the animal.

What are the signs in humans?

Echinococcosis in humans is most commonly due to a cyst in the liver. Only rarely do cysts develop in the lungs. As the cyst in the liver grows the result will be pressure on the surrounding tissues. Signs associated with a liver cyst include a decreased appetite, nausea, vomiting, pressure around lever and general fatigue. The growth of the cyst causes lever pain, and it is sometimes sore to the touch If the cyst blocks the gall bladder ducts, jaundice will appear. If the cyst breaks it will cause more complications. Many smaller cysts may grow in the abdominal cavity. A cyst in the lung will result in signs of chest pain and coughing. The cysts usually grow slowly but signs will get worse over time as the cyst grows in size.

How can the herder prevent echinococcosis infection?

- Get your dog treated for tapeworms with antiparasitic drugs. Talk to the veterinarian and follow the necessary treatment course for your dog This procedure is important for eliminating and preventing human and animal echinococcosis.
- Get rid of any stray dogs in your grazing areas.
- Do not give the dog organs after slaughtering sick animals. This will break the life cycle and prevent your dog from becoming re-infected
- Burn or deeply bury the infected organs of livestock so that they are not eaten by dogs or wild carnivores.
- Teach the children to wash their hands after playing or contacting dogs.
- Always wash your hands before eating or preparing foods to eliminate the risk of ingesting tapeworm eggs.

Task-10

Fill the boxes below listing the zoonotic diseases.

Zoonotic diseases, the diseases that transmit from animal to human

Conclusion

Now you have learned about some zoonotic diseases that cause illness in humans and animals. You will notice that in some cases the diseases can also be transmitted between humans You have learned the term "carrier of infection", which is the person or animalthat doesn't get sick, but

transfers the infection. It is important to learn simple preventative tips. The signs of these diseases may resemble some animal and human infectious diseases, therefore for diagnosing and treating the diseases you will have to seek professional help. A good knowledge of the transmission of zoonotic diseases will play a significant role in decreasing the incidence of disease and even eradicating then in some cases.

Test for second chapter: Test and estimate yourself.

1. Circle the transmission mode for Brucellosis.

    a. respiratory way

    b. soil, hay and fodder that contains the microorganism

    c. contaminated seed

2. Animal signs of Brucellosis

    a. depression

    b. joint pain

    c. abortion

3. Fill the blank space

You should before consuming meat, milk and egg.

4. People should not take off the hides and open the carcass of the animal that has died from zoonotic diseases.

    a. Yes b. No

5. Which of the following diseases causes nerval changes.

    a. Anthrax

    b. Brucellosis

    c. Rabies

6 Salmonellosis infection can be transmitted from row egg, not enough cooked or boiled meat and milk,

    a. Yes b No

7. Source of echinococcosis is

    a, cattle

    b.

c. dog, cat

8. There is a risk of getting infection of if you don't wash your hand after playing with dogs.

a Ahthrax

b Echinococcosis

9. Echinococcosis cyst mostly locates in

a. lever, lungs

b. faringes

c. big bowel

10. The causative organism of is kept around the rodent's livelihood,

a. rabies

b echinococcosis

c. plague

Answers: 1-a, 2-c, 3-cook well, 4-a, 5-c, 6-a, 7-c, 8-b, 9-a, 10-c

Bibliography:

1. "Zoonoses and Communicable diseases common to man and animals" Second edition Pedro N. Acha, Boris Szyfres (Pan American Health Organization)

2. " Sheep health handbook" a field guide for producers with limited veterinary services by Thomas R. Thedford, DVM

3. " Zoonoses" V. Tomescu, I. Gavrile, D. Gavrile

4. Materials from Internet, 2000.

Fourth Chapter
The Role of Veterinarians

The objective of this chapter is to discuss the role of the veterinarian in animal health. The role of the veterinarian in providing veterinary preventative medicine as well as the role of the veterinarian in disease control and disease management will be discussed. The chapter will explain what a vaccine is and how it protects livestock from infectious diseases. The chapter will also summarize the preventive measures to be taken to protect livestock from parasitic diseases.

Veterinary/Herder Relationship

Veterinarians working in soums in Mongolia today are private business people and their work is no longer supported by the state. The private veterinarians have a lot of experience and many services to provide to herders. The services, however, must be paid for by the herder. The state still does provide vaccines against some infectious diseases at no cost, however, the cost of providing the vaccine must still be covered. The private veterinarian must cover the costs of his or her travel expenses, the upkeep of his or her clinic and pay for the equipment and the drugs that he or she uses to treat livestock. This is why herders must pay for the services provided by veterinarians.

The veterinarians must explain the services they have to offer to herders. They should give advice and guide the herders in their decisions. For example if anthrax is a disease of concern in an area the veterinarian should inform the herders. The veterinarian should explain what anthrax is and what can be done to treat or prevent the disease. The herder then decides whether or not to have his or her animals treated. The herder should ask the veterinarian questions and the veterinarian should take the time to explain things to herders. The medications, vaccines and services that veterinarians can provide are very important but so is their advice.

What is a vaccine?

All animals have what is called an immune system. The immune system is designed to fight off infections. When an infectious microorganism enters the animal's body (a parasite, bacteria or virus) its immune system activates what are called anti-bodies that are capable of destroying or weakening the microorganism and protecting the animal from infection. It is possible to prepare an animal's immune system to fight specific diseases by vaccination.

A vaccine is a biological substance that usually contains a very little amount of an infectious agent like a bacteria or virus that has been changed and inactivated. The vaccine is usually given to the animal by injection. The changed infectious agent in the vaccine "tells" the animal's immune system to get ready to protect it from the specific disease. If vaccination is effective the animal's immune system will be able to fight the disease fully when exposed to the real disease.

Why is it important to vaccinate all animals?

There are many vaccines that are produced to protect livestock from infectious diseases. No all livestock need to be vaccinated with every vaccine. There are specific times of year that vaccination is necessary and there are specific regions of the country where certain vaccination is recommended.

Some vaccines protect livestock for a long time and others are only protective for 2-6 months. Some diseases are only present in some parts of the country. Other diseases are present everywhere

and affect all kinds of livestock. The herder and the veterinarian must consider these factors and decide which vaccines to use, which animals to vaccinate and when to vaccinate.

Here is a story:

The area where Herder M lived was known as a center of anthrax. However, no cases had been recorded during the last two years. Veterinarian D came to vaccinate Herder M's 75 cattle but the herder refused Veterinarian D's services. In September an outbreak of anthrax took place in Herder M's corral and he lost 14 of his cattle. If all the cattle had been vaccinated he would have protected himself from such a loss. The anthrax vaccine becomes active or protective 14 days after administration and protects the animal for one year.

Planning the vaccination.

Certain kinds of infectious diseases tend to break out during certain times of the year. There are also certain areas of the country that are known to have outbreaks of different kinds of infectious diseases. You must gather information from your veterinarian and fellow herders to determine the answers to the questions below and design your vaccination plan. Remember, vaccination needs to be done in time to allow for protection before the disease outbreak.

- What infectious diseases are common in your area?
- What vaccines do you consider as necessary for your livestock?

The following table will help you to plan the vaccination of your livestock-

Vaccination calendar.

#	Name of the disease	Months											
		Jan.	Febr.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	Infectious enterotoxemia				■	■			■				
2	Enterobacteriosis								■				
3	Enterotoxemia, Enterobacteriosis					■							
4	Anthrax				■	■					■	■	
5	Brucellosis								■	■			
7	Contagious agalactia			■	■								
8	Contagious ectyma												
9	Enterotoxemia bradzot				■	■			■				
12	Enzootic abortion												
13	Contagious caprine pleuropneumonia												
14	Listeriosis												
15	Small stock Salmonellosis								■				
16	Colibacteriosis Salmonellosis	■	■										
17	Calf Salmonellosis		■										
18	Black leg				■	■				■	■		
19	Haemorarrhagic septicaemia	■	■							■			

Using this table you can find out against what diseases vaccines should be given to your livestock and when.

Helpful Hints;

If you vaccinate pregnant females with a vaccine that is safe to use in pregnant female livestock during the last few weeks of their pregnancy, their offspring will also be protected from disease.

Some vaccines like brucellosis vaccine should not be used in pregnant livestock. Vaccinate for diseases like brucellosis in the summer after livestock have given birth.

What is it important to remember when vaccinating livestock?

The area where vaccine will be injected should be free of dirt and mud. An animal should be examined prior to injecting the vaccine. If the animal has a disease, fever or if it is too weak to bear the vaccine, it should not be vaccinated.

If a sediment has formed in the vaccine, the container should be shaken before transferring the contents into a syringe.

Live and dry vaccines should be used within 24 hours after dissolving and they should be kept in cool place away from light. If vaccination takes place in cold time of the year, it should not be allowed to freeze.

Upon completion of the vaccination a document should be filled in by the veterinarian. The document should indicated the herd that was vaccinated the livestock that were vaccinated the type of vaccine used. The date and name of the veterinarian should also appear on the form

Temporary fever, lameness, shivering, lack of appetite and lying down may be observed after the vaccination. If these symptoms persist for several days or are seen in several animals the veterinarian should be notified immediately. If complications such as swelling and inflammation of the injection area or death of vaccinated livestock take place, qualified help should be sought and further vaccination stopped.

Internal Parasite Control (Summary)

Internal parasites include nematodes, tapeworms and protozoan parasites. Internal parasite transmission is most common when the weather is warm and wet because the eggs of the parasites are shed in the dung which then infects the pasture. In Mongolia internal parasite transmission is probably most common in the summer months. Internal parasites are more of a problem in young animals. Adult livestock often are not affected by internal parasites.

Symptoms: Signs of disease caused by internal parasites include diarrhea, weight loss and loss of an interest in feed. Internal parasites can also cause blood loss and loss of protein which results in pale mucous membranes and edema (fluid collecting under jaw).

Treatment: Livestock should be treated with an anthelmentic when suffering from internal parasites. An effort should be made to identify the type of parasite the livestock is infected with by analyzing the feces. This can be done by your veterinarian.

Prevention:

- All livestock in the herd should be treated right before the summer months for internal parasites, This will hopefully reduce the contamination of the pasture during the warm, rainy months when transmission is highest.
- Treatment, especially of young livestock, should be repeated in the late fall or at weaning to kill the parasites before they become arrested in the body.
- Efforts should be made to keep pens clean and dry

- The density of livestock per pen should be kept to a minimum

External Parasite Control

(Summary)

Symptoms: The general signs of external parasites in livestock include itching, hair loss and weight loss. A severe infection with lice can also cause significant blood loss and severe mange often results in scab formation.

Treatment/Prevention:

- The most common type of prevention and treatment for external parasites is dipping in an insecticide bath. This should be done yearly and sometimes 2 times a year if there is a high rate of infection in the herd. Caution should be used when dipping young animals because they are more susceptible to the insecticides and dipping milking females or females in late pregnancy should be avoided. There are many different types of dipping materials and they should be used as directed by the label and the veterinarian.
- Treatment of lice must be done at 2-week intervals for 2 to 3 treatments to break the lice life cycle and cure the animal. The whole herd must be treated. Injectable and oral ivermectin are effective against biting lice and insecticide powders are also available.
- If possible areas with a high density of ticks (tall grasses, etc.) should be avoided.
- If possible graze livestock in shaded and cool areas where flies and other insects are less prevalent.
- In addition to chemical insecticide dips, powders and injectable drugs, some natural insecticides can be used to protect the livestock from external parasites. Plants such asjiinipervs sabin and artemisia and the ash of dung have been reported in the Mongolian literature as good repellants for lice. These plant powders and ash can be sprinkled on the litter of goat pens.
- The Mongolian literature also reports that a post smeared with horse or marmot grease and covered with soot and powder ofjuniperus sabina and artemisia will act as an attractant to ticks. These posts can be set up away from animal enclosures to draw the ticks away from the livestock.

The Cost of Parasites and the Cost of Control

The direct and indirect damage that parasites cause to an animal can be significant. Parasite infections can decrease an animal's immunity to other diseases and decrease its level of production. Internal parasites cause diarrhea and weight loss in young animals. External parasites and fly larvae damage hides. There is a big difference between the amount of wool taken from healthy sheep and the amount taken from sheep affected by mange. It has been calculated that the cashmere output of a goat affected by parasites is decreased by 15%. Healthy goats produce approximately 200gm of cashmere. Fifteen percent of 200 gm is 30gm. Loss of cashmere from 200 goats makes 6000gm or 6kg. If the price for a kg of cashmere is 35,000 Tg, the result will be a loss of 210,000 Tg.

The cost of dipping 200 goats for external parasites and treating 200 goats for internal parasites would cost much less than the 210,000 Tg lost due to lost production. If treatment of each goat cost 150 Tg (50 Tg for dipping and 100 Tg for ivermectin) the cost of treatment would be only 30,000 Tg. The tasks below will help you make these calculations.

Task 4.

Interview an experienced herder about traditional remedies against mange, grass ticks and other parasites Use the following hints:

1. Find out how journalists take interviews; read interviews in newspapers

2. Select a person whose experience would be interesting and useful to others.

3. Prepare questions for the interview.

4. Try to find out as much as possible about preventive and remedial ways of treating animals affected by parasites.

Task 5.

Herder Dorj owns 570 heads of small stock. Calculate the amount and cost of internal parasite treatment for all his stock (3-4ml of Albendasol or Vermital per sheep). Calculate the amount and cost of vermifuge for your livestock. Use the following hints:

1. 1 liter of Albendasol=8500 MNT, the same amount of Vermitan= 12000 MNT

2. 3 ml per head of small stock makes 570 heads x 3=1710ml

3. 1 liter-1000ml

4. 1 liter costs 8500 MNT, 1ml costs 85 MNT, 1710ml x 85=?

Task 3.

1. What measures will you take when an animal is affected by several types of ticks?
2. What can you do to prevent infection of horses by fly larvae? Develop a pasture alternating plan and discuss it with your family.
3. How will you treat mange in winter?

Use the following hints:

1. Different kind of treatment is required against each parasite. In case various kinds of ticks infest an animal's body, bathing in solutions with various composition and spraying should be used.
2. The simplest prevention methods are change of pastures, grazing against wind and not letting the livestock lie down on the ground in the hot time of the day.
3. Washing of livestock affected with mange is not suitable in winter.

Conclusion

Veterinarians play an immensely important role in vaccination and health maintenance of the livestock. Many types of vaccine are prepared and used in our country. Depending on the time of infectious disease outbreak, vaccination periods vary throughout the year. There are several species of parasites such as lice, fly larva, worms and ticks that cause damage to the animals' body and decrease their productivity. Many medicinal preparations are used to prevent parasite distribution and to fight parasites already present in the organism. Prevention and treatment cost far less than

suffering losses as a result of avoiding or skipping prevention and treatment measures. It is important that preventive measures be taken promptly. By applying these simple recommendations and working closely with your veterinarian you will be able to maintain the health of your livestock and increase your livestock's productivity.

Appendix

This section includes a range of information that we hope herders will find interesting and helpful. Some of the sections are directly related to animal health and others are related to livestock management and Mongolian traditions.

Section 1

Fluid Therapy for Animals with Diarrhea

There are many causes of diarrhea in livestock. In many cases the most important way to manage diarrhea is to replace the fluid being lost and prevent dehydration. The infectious agent causing the diarrhea will often clear up on its own or with some antibiotic treatment. Diarrhea is often the cause of death in young livestock that become dehydrated and too weak to take in any fluids on their own. The instructions below outline how to determine how much fluid a young animal needs and the ways to replace that fluid.

Young animals must drink 10% of their body weight in milk or a replacement fluid per day. If the animal is dehydrated that fluid loss must be corrected and the ongoing losses from the diarrhea must be replaced.

To estimate the amount of fluid that must be given to an animal per day use the following formula.

Weight in Kg X 10% (0.1)+ Weight in Kg X % dehydration + losses in L = fluid replacement

The percent dehydration is determined using the guidelines below:

Fluid Loss	Signs
0-5% (0.0-0 05)	None
6-8% (0.06-0.08)	Dry mouth, skin remains erect when pinched
10% (0.1)	Body cold, unable to stand
12% (0.12)	Flat on side, near death

Example: A 1-week-old kid weighing approximately 3 kg has had diarrhea for 2 days. It is weak with a dry mouth and when you pinch the skin above the eyes it stays erect. It is passing approximately 20 ml of watery diarrhea every 6 hours. To determine the fluid replacement rate for this kid you would do the calculation below:

3 kg X 10% (. 1) + 3 kg X 7% (.07) + .08 L (80 ml) = 0.59 L (590 ml)

The amount calculated for fluid replacement should be administered in 3-4 feedings over 24 hours So the kid in the example should receive 4 feedings of approximately 150 ml of fluid per day.

When the goat kid has diarrhea it is not able to digest its mother's milk and must be provided with a replacement. Below are recipes for fluid replacement that you can make at home The fluid must have an easily digestible sugar or energy source as well as the salts and electrolytes that the kid is losing with the diarrhea. The kid should be fed only the fluid replacement for two days and then gradually put back on milk

The fluid should be administered to the kid in a bottle or by a tube into its stomach if it will not suck. If using a tube make sure that it is small and soft and that it is not in the lungs If the tube is in the right place you should hear bubbles in the kid's stomach when you blow gently on the tube. If it is in the lungs the kid will cough and struggle.

The fluid should be warm and freshly prepared. If replacement fluid is stored for more than 1 day it should be frozen and reheated before use.

Once the diarrhea is clearing up feed the goat kid some freshly prepared yogurt. This will replace the good bacteria in its stomach that was lost when it had diarrhea.

Fluid Replacement Recipe:

10 g of salt

5 g soda (sodium bicarbonate)

120 gofsugar

4.5 L of water

Section 2

Animal health as a daily chore and seasonal routine

A herder's daily chores include observing the weather, feeding and tending of animals, regularly feeding salts to animals, cleaning animal sheds, herding the animals, watering the animals, bringing animals back from grazing grounds to animal sheds and observing livestock for signs of illness.

A chart describing a herder's seasonal routines is below. With the seasons come certain diseases in different livestock. The herder should be especially attentive to disease in his or her livestock at specific times of the year, Hints are in the chart below.

Chart

A herder's seasonal routines and disease detection

Spring	Summer	Fall	Winter
-taking animals to spring quarters -raising the offspring -finding fresh grass and herding the livestock -tending animals shedding hair -sorting out the animals Look for newborn livestock with respiratory or umbilical infections. Look for signs of diarrhea in young and newborn livestock.	-milking-insemination of cows and mares -preparing dairy products-battening animals on better pastures -removing the wool Look for signs of mastitis or udder infection in your milking livestock Make sure your young livestock are growing every day	-battening of animals -prepare for winter -breeding of small livestock -slaughtering of animals-hay harvesting Look for signs of reproductive problems in your small livestock Cull or slaughter weak or sick livestock or those with reproductive problems or abnormalities	-take good care of animals until spring -feeding up the animal: -raising the young animals -breeding of camel cows Look for signs of external parasites Make sure all of your livestock are maintaining their weight Look for signs of reproductive problems in your large livestock

Task 4.

List summer work of a family that owns 500 heads of small livestock, 10 cows and 10 mares.

Use the following hints:

1. Insemination should be organized bearing in mind the most suitable time of the year for raising the young and the gestation period. Insemination of cows and mares is in summer.
2. Summer is a season for fattening the small livestock and removing the wool.

Section 3

Culling Decisions

Section 4

Livestock insemination and breeding

Herders know that the selection of pastures, the availability of water and sources of salt, animal sheds, and hay harvesting are key concerns in the management of livestock. This book has also discussed livestock health in detail and the importance of preventive measures and treatment of livestock disease. The breeding and selection of livestock for breeding is also very important. Information on breeding and selection is providing below.

Insemination.

In order to preserve useful characteristics of livestock in the genes, a dam and a sire are selected for breeding. Because different livestock reach sexual maturity at different age they are used for insemination and breeding at specific age and during specific period. See table 7:

Kind of livestock, sex	Horse	Camel	Cattle	Sheep	Goat
Age for breeding, years and months					
Period for breeding, years					

Mating season starts for horses in June-July, for cattle - in June, sheep and goat - in October, camels - in December. Livestock herds are arranged with approximate estimation: 12-15 cows per bull, 15-20 mares per stallion, 12-18 camel cows per camel- bull and 25-30 ewes/does per ram/buck.

Selecting a sire.

It is crucial to select the right sire in order to produce high quality livestock. An old saying of herders is: "If you want good sheep start working from a ram, if you want a good corral start with selecting a good place". Thus, health and productivity of livestock highly depend on selecting a good sire.

Selecting a stallion

There are over 30 characteristics which a good stallion must possess such as a well-built muscular body, big eyes and nostrils, longish ears, thick neck, wide chest and wide hips, black hooves, thick mane and tail, coarse and stiff fetlock, evenly located testicles, dark coat, etc. Milk is given and sprinkled onto the head and mane of the stallion, and a special prayer is said when selecting a stallion to mate.

Selecting a camel-bull

When selecting a camel-bull the following characteristics are important: muscular, with stiff humps, wide forehead, big protuberant eyes, not too high crest, with straight sinewy hind legs, short pasterns on forelegs, with even hooves, stomach loose towards groin,calm, etc. This camel-bull has to be brown-reddish or dark-brown, four or five years old, bom in cold time of the year to a camel-cow of good genes. A special prayer for a camel-bull is said.

Selecting a bovine bull

Wide forehead, hard and short horns, short and muscular neck, wide chest, head, withers and hips in one straight line, muscular thighs, straight forelegs, wide and straight leg bones, thick skin and dark coat are some of over ten characteristics of a good bull. Milk is given and sprinkled onto the forehead, and a special prayer is said when selecting a bull.

Selecting a buck

Relatively tall, with long snout, horns not too sharp, with plenty of fine quality cashmere and thick dark coat are some characteristics of a good buck Butter is smeared on horns, forehead and hooves, and milk is given and sprinkled along its back when selecting a buck for breeding A special prayer is said for him to breed good offspring. *

Selecting a ram

Straight legs, wide back, large tail, plenty of wool, black hooves, black eyes are some of over ten features of a good ram. Butter is smeared on horns, forehead and hooves, and milk is given and sprinkled along its back when selecting a ram. A special prayer is said.

Origin, productivity, physical development, character and coat are crucial when selecting a sire. **Similar considerations must be made when selecting your breeding female livestock as well. The quality of their wool or cashmere, their ability to raise strong young, their milk production and their general health and conformation must be considered.** One becomes an expert in livestock breeding over time. You must keep records of your matches and learn from your successes and mistakes. Some other factors that will influence your success as a herder are outlined below.

Livestock tending involves a good knowledge of the character of one's livestock You must meet the needs of your livestock, organize breeding and insemination and improve the genetic quality and productivity of your livestock

Livestock herding involves the proper selection of seasonal quarters and pastures for livestock to prevent their starvation and keep them healthy. You can determine how much pasture your livestock need.

Livestock tending and feeding involves creating favorable conditions for keeping livestock healthy such as ensuring that fresh water and sources of salt are available in all seasons, that animal sheds are warm and that enough hay is prepared to last until the warm season when new grass will be available. **Remember that when the wind blows that the actual temperature the livestock experience is much lower than the air temperature. At times of wind and cold shelter is extremely important. Simply protecting your livestock from the wind will decrease cold stress. They will not use up at much energy to keep warm and they will survive the winter.**

Section 5

Livestock Behavior

Understanding normal livestock behavior will help you identify abnormal behavior that often indicates a sickness or disease. Understanding normal livestock behavior will also allow you to work more closely with your animals and manage them in ways that encourage their positive behaviors and discourage their negative behavior.

A newly born animal starts getting on its feet and sucking its mother and the mother starts licking its offspring, protecting and feeding it. This behavior is based on instinct and determines or ensures an animal's survival. On the other hand, animals can be trained to exhibit new behaviors or to follow the commands of humans. Domestication of wild animals was based on the encouragement of behaviors useful to humans and elimination of negative behavior followed by further training through creating new reflexes and encouragement of attachment to human beings. This behavior created through new reflexes can be easily changed therefore constant encouragement and confirmation is necessary. In other words, animals need to be used all the time and kept under control. When training animals it is important to use non-violent but bold methods of training in order to attain good results. For example, when catching a horse for the first time all actions should be bold and quick' chasing the horse into the herd and catching it properly in one go. **Your actions should not** frighten the animal.

Task 5.

What reflexes will it be useful to train when milking animals that have never been milked before? List the reflexes. Use the following hints:

1. Training of animals should be based on discouragement and gradual elimination of "bad" habits and encouragement and training of useful to humans.
2. Animals used to being milked are calm. If animals get irritated and nervous when milked that affects the amount of milk they produce and let down.
3. Newly created behaviors are easily forgotten therefore it is important to milk the animals as often as possible.

Examples of Animal Behavior and Temperament

Each livestock has its own peculiar behavior. Horses are very active and alert animals. Usually they are gathered into a herd led by a stallion. The stallion protects its herd from other stallions. Horses are easily trained to saddle and riding, but will also easily forget these behaviors. Horses may run away, bite, buck, kick, swerve, shy away, tear their tethers, bolt and display other negative behavior due to improper training. When riding the horse for the first time it is important not to let it buck and direct it without tightening the bit and bridle too much. If the mouth is cracked because the bit and bridle is too tight or if the ears are twisted too often, the horse will develop bad habits (picture).

Cattle are generally very calm gentle animals and they can be trained by calling and stroking. Butting and kicking should be discouraged (picture).

Camels are calm animals and very obedient to their owner. They graze scattering around the pasture within site of each other. They also like rolling on saline spots and ashes. In order to avoid provoking the spitting of cud, kicking, and shying away, camels should be treated gently (picture).

Sheep are humble, passive animals that are often slow to learn. On the contrary, goats are quick to learn, active, and alert animals. They are good at finding the best pastures (picture).

Section 6
How to address the animals?

There are many ways of calling animals when working with them (table 2).
Table 2.
Ways of calling animals.

When	Sounds used for calling			
	Camel	Horse	Cattle	Sheep, goats
To drive/direct the animals	Hoj, hoog	Choh, chuu, guug, chish, whistling	Haj, haa, hoog, chuu, whistling	Guug, chaag, chish, toj, haig, tsaig
Calling	Oo, haa, hoo, toor	Haia, ai, gurui	Hai, hoo, oov	Zuuzuu, tur tur
Watering, herding	Guug, haa, haia	Haia, whistling	Hoog, oo, haa	Haia, chaig, chaa, whistling
Milking, letting lactate	Duur, hoos, toor	Haia, tuus, gurui	Oov, haa, oo	Zuuzuu, toig, hoolboi
Separating and catching the young	Guug, guurgii, haa, hoos	Gurui, haia, chuu	Guurgii, oov, haa	Guurgii, haia, chuu

These sounds are used for creating reflexes through hearing. In addition there are sounds for making an animal accept its rejected offspring. These are different for each species of livestock.

Section 7

Mongolian units of measurement.

It is useful to know how Mongolian units of measurement traditionally used by herders correspond with metric units.

Measuring length.

Mongolians measure length with hands and arms, paces, distance covered daily by livestock and some household utensils. Measuring with hands.

A finger (1 finger=2cm, 2 fmgers=4cm) 3 fingers (guriu)=6cm, 4 fingers(doruu)=8cm, 5 fmgers=l palm=10cm, barim/short barim=10cm, long barim=14cm, soom (span between the tip of thumb and the second joint of index fmger)/short soom=15cm, long soom=19cm, too(span between the tip of thumb and the tip of middle fmger)/short !_ too=18cm, long too=22cm, elbow/short elbow=32cm, long elbow=40cm, delem/short delem=80cm, long delem=86cm, aid (span between two arms spread sideways), short ald=160cm, long ald=176cm.

Measuring by pacing.

Pace/half pace-80-88cm, full pace=160-176 cm, foot, two feet (length), foot and two feet (width), span between two legs spread as wide as possible" 160-176cm.

Measuring by distance covered daily by livestock Sheep pasture=l-2km, cattle pasture=2-2.5cm, calf pasture^lkm, horse pasture=4-4.5km.

Measuring with household utensils.

Belt^-em, tethering line=10-15m, girth-rope of ger=20-25m, a roll of silk= 12-16m, silk for a deel=4-6m, whip=40cm, rafter of ger roof=2m, etc Other traditional units of measuring.

Distance within eyesight^Skm, tree/wood area?? =1.06km, beer= 7.4km, urtoo=30km, a , day's distance=90km, a 24 hour distance^ 120-13Okm, neighborhood(close)=l-2km, remote neighborhood^.5kn, huvi=57.6km, sy^O.003mm, hu=0.0032mm, li=0.32mm, fun=3.2mm

Measuring areas.

Square urtoo-900sq.km, square saakhalt~0.64sq.m, an area as large as an animal _shed^2000sq.m, an area as large as a ger base^20sq.m, square elbow=1600sq.cm, square too=400sq.cm, square soom=320 sq.cm, square yamkh=10.24sq.cm, square fun=10.24 sq.mm, square li=0.1024 sq.mm, hubaari=9,216 ha, ui=0.9ha.

Measuring cubic capacity**.**

Liquids:
liquids are measured with a sack made for airag fermenting, a cauldron, a bucket, a tea pot, a tea jug, a ladle, a bowl, a spoonful, a sip;

Powder substances:

A sack, a cauldron, a cup, a bowl, a ladle, a handful, a pinch;

Solid substances:

By length, width and height measuring with traditional units mentioned above; as high as a mountain, as big as a ger/bull/cow/sheep/head/kneecap.

Measuring mass.

Sy=0.37mg, hu=3.73mg, li=37.30mg, fun=0.37gr, tsen=3.73gr, lan=37.30gr, jin=596.81gr, pu=16.30gr

Measuring time.

60 years^l century Qaran), 12 months=lyear, 90-91 days=l season, 30 days=l month, a week. 24 hours divided into 12 hours 2 hours each, 24minutes=l moch, lmin=lhuvi, 1 breath=4 seconds

Mongolian hours (2 hours each)

Mongolian name	Position of the sun	Time
I . Dragon	sunrise	7.40-9.40
2. Snake	sunrise	9.40-11.40
3. Horse	Noon	11. 40- 1.40pm
4. Sheep	Early afternoon	1.40-3. 40pm
5- Monkey	Late afternoon	3.40-5.40pm
6 Rooster	Sunset	5.40-7.40pm
7. Dog	Twilight	7.40-9.40pm
8. Pig	First stars	9.40-1 1.40pm
9. Rat	Midnight	11. 40pm- 1.40am
10. Bull	After midnight	1.40-3.40am
1 1 . Tiger	First morning light	3.40-5.40am
12. Rabbit	Dawn	5.40-7.40am

Section 8

Tips for ger work

- Milk will not boil over if the brim of a cauldron is rubbed with vinegar.
- Milk will not curdle if it is boiled in a pot washed with cold water.
- When boiling, milk will not curdle and will not burn if a piece of sugar is put into it.
- No skim skin will form for 6-7 hours if the milk is put into a pot washed with hot water just after boiling.
- If milk has burned, pour it into another pot and place it into a bigger pot with cold water. Sprinkle a pinch of salt and the taste of burned milk will disappear.
- When slicing cheese dip the knife into hot water. Cheese will not crumble.
- If the gall is punctured when dressing a carcass, rub the meat with salt and wash with cold water. The bile taste will disappear.
- Frozen meat will defrost quicker if dipped into cold water and put into a pot with lid.
- Fried meat will be tastier if rubbed with a little sugar before frying.
- Hot oil will not splatter if sprinkled with a pinch of salt.
- Meat will keep fresh if wrapped in a cloth permeated with vinegar.
- Meat will not spoil for a week if washed, then wrapped into cloth permeated with 0.51of water where a teaspoonful of salicylic acid was dissolved.
- Slightly spoilt meat can be improved by slicing and washing it in cold water, thenkeeping it for 2-3 hours in water with an egg-size piece of charcoal in it, then boilingthe meat in the same water after removing the charcoal.
- Frozen potatoes should be washed in cold water and cooked in boiling hot waterwithout letting them thaw.
- Frozen onion will resume its freshness if kept in cold water for three hours.
- Vegetables with the exception of potatoes will keep longer if wrapped in a wet cloth.
- To prevent a cut onion from drying keep the cut side in salt.
- Use washed leek immediately: it does not last after washing.
- If peeled potatoes are kept in cold water they cook quicker.

Section 9

Predicting the weather.

Herders have been able to predict the weather by traditional methods such as observing animals, plants, sun and moon, stars and position of the constellations. Below are some hints for predicting the weather based on observations. See which observations you find to be true.

Predicting the weather by observing animals

- If livestock keep to animal sheds it is a sure sign of bad weather.
- If cattle run in the summer heat with their tails up dzud will take place in the winter.
- If sheep and goats' noses get stuffy and their ears wet, it is a sign of coming precipitation.
- If tethered young horse shake themselves it will rain
- If the paunch of a slaughtered sheep has a thick layer of internal lining, winter will be snowy.
- If male deer start bellowing later than usual winter will be mild
- If migratory birds fly high winter will be warm, if low, dzud may take place in winter.
- If grouse is abundant and bustard stays over the winter, if ticks occur later than usual, if white field chipmunks do not hibernate over the winter, if rats collect little fodderand marmots hibernate later than usual -these are sure signs of relatively warm winter.
- If grasshoppers and locust become abundant there will be a drought.
- If marmot stuffs his burrow close to its opening, winter will be warm, if further inside the burrow, winter will be harsh.
- If kidneys of roe-deer and hare have a lot of fat accumulated on them, winter will be snowy.
- If sparrows gather in flocks, temperature will fall.
- If black crows and rooks are noisy and fly around in flocks there will be a storm.
- Flies and mosquitoes flying low over water surface, beetles getting abundant, cat sharpening its claws, dog rolling up into a ball are signs of coming rain.

Predicting weather by observing plants.

- If plants start blossoming when stems have not completed their growth, a drought will take place.
- If grass starts growing in sunny places in fall, winter will be warm.
- If trees in mountainous areas start getting yellow from top, winter will be cold. If the foliage starts getting yellow from bottom, winter will be warm.
- If feather grass grows in abundance, winter will be snowy.
- If dandelions grow in abundance the summer harvest will be poor.
- If (plant with white flowers) grows in abundance drought will take place and winter will be snowy.
- Abundant growth of Stipa Glareosa is a sign of coming dzud.
- If grass shows signs of thinning in fall winter will be cold, if as usual-winter will bewarm.
- If grass on pastures starts getting brownish early in fall, winter will be cold.

Predicting weather by change in household utensils

- Shrinking and stiffening of ropes, felt and other fabrics made of wool and animal hair indicates coming rain.
- If smoke comes out directly upwards, weather will be fine. If smoke goes sideways, wind will become stronger and precipitation is possible.
- If soot on cauldrons and hearths starts burning temperature will fall.

- If clothes and fabrics start getting damp, it is a sign of coming rain.
- If tobacco tar gets damp and leather items get soft it is a sign of a coming rain.

Predicting weather by change in the sun, moon and stars

- If the sun is red at sunset, the coming day will be clear and warm.
- If the sunset is cloudy, weather will worsen.
- If the sun and the moon have an aura weather will worsen.
- If stars twinkle nights will be colder.
- If wind blows clockwise it will become stronger and precipitation is possible.
- If clouds traverse both snow and rain are possible.
- If wind blows softly in north-eastern direction when it is snowing or raining, the precipitation will last for a long time.

Weather according to Lunar calendar

- The 27th day of each month by Lunar calendar shows the weather of the comingmonth.
- If there is a frost after the first snow in fall, dzud is likely in winter or spring.
- If temperatures fall about two weeks before the nine cold weeks start, the nine cold weeks will be warm, and vice versa.
- If sky (??) disappears on the 9th day of the last month of fall by Lunar calendar and reappears in a week's time, winter will be warm. If it reappears in more than a week's time, dzud is likely to happen.
- If the moon is in vertical position on the second day of the New Year by Lunar calendar the month will be warm, if it is tilted backwards winter will be cold and spring will be warm.
- The Moon and stars..... takes place in the first month of winter. If the weather is bad before it weather in general in that month will be favorable. If the weather worsens after it, weather in general will be not very favorable. If the Moon and stars traverse at long distance winter will be good. If higher, winter will be warm, if lower, winter will be harsh.
- Precipitation which started on Saturday is likely to last until the next Saturday.
- According to long-term observations of herders, dzud is more likely to happen in the years of Monkey, Bull, Pig and Dragon.

Sources:

Ajello, Susan, editor. The Merck Veterinary Manual. Eighth Edition. Merck & Co., Inc., Whitehouse Station, N.J., U.S.A., 1998.

Foreyt, William J. Veterinary Parasitology: Reference Manual. Second Edition. Board of Regents of Washington State University, U.S.A., 1989.

Smith, Bradford. Large Animal Internal Medicine. Second Edition. Mosby-Year Book, Inc., 1996.

Smith, Mary C. and David Sherman. Goat Medicine. First Edition. Lea & Febiger, A Waverly Company, Baltimore, U.S.A., 1994.

Thedford, Thomas. Goat Health Handbook, A Field Guide for Producers with Limited Veterinary Services. Winrock International, 1983.

POVERTY PERCEPTIONS
AMONG RURAL HERDERSAND
SUM INHABITANTS OF CHULUUT SUM,ARKHANGAI AIMAG IN MONGOLIA

September 1995

Provided by
Rosamund Ebdon
CSD/SCF
Centre for Social Development, IAMD, Ulaanbaatar, Mongolia
in cooperation with
Stephan Baas, FAO Headquaters officer

Table of contents

POVERTY PERCEPTIONS AMONG RURAL HERDERS AND *SUM* INHABITANTS CHUULUUT *SUM*

Glossary

Aimag	province/district
sum	sub-district (rural town)
bag	lowest adminstrative unit (rural)
khot ail	small collection of herding households

I. Introduction

TЪe following results are based on field investigations in Chuhnrt *Sum* conducted from 23/8/95 to 30/8/95 by a 7 person team consisting of CSD/SCF staff members and an FAO headquaters officer. The investigations were guided by TOR drawn-up by the FAO TCP team leader, as part of a broader FAO mission in Arkhangai The study was divided into two components:

(a) a 2 1/2 day interview sequence with herders based on PRA techniques. These field investigations were outlined to target mainly poor herdering households who had been identified through a wealth ranking exercise at the beginning of investigations. Following a modified "sondeo approach" the team worked in 3-4 sub-teams and in two different *bags,* namely Khurmen *bag* (No. V) and Zuu mod *bag (* No. П). In total the team reached 15 different households including the two *bag* governors households, 3 middling rich households, and 10 poor households. In addition the *sum* governor was intensively consulted. Each single interview session lasted between 2-3 hours focusing on the issues given in the table of contents of this report. Each single session provided deep insights into household strategies and poverty perceptions.

(b) a 2 1/2 day training workshop in PRA techniques using exclusively poverty related topics for the frequent practical exercises conducted during the sessions (Appendix 7, workshop agenda). The workshop brought together representatives from the *sum* government, *bag* governors, herders representatives and poor households from the *sum* centre. Total number of participants was 20. Discussions were very open and animated between the different groups of participants, thus offering an optimal forum for the research team to analyse and compare poverty perceptions of the different groups, as well as their approaches and proposals to alleviate poverty. A list of participants is attached in Appendix.

The results of both study components are put together within chapters and of this report. They are based on herders' and *sum* centre inhabitants' perceptions only. Chapter IV adds impressions, conclusions drawn by the research team, and its recommendations for further project activities and project investigations.

Both herders and *sum* centre representatives were extremely open minded and cooperative, thus facilitating study significantly. The research team wishes to take this opportunity to express its deep thanks to the peoplt Chutuut *sum* for this positive and valuable experience.

П. Causes and Characteristics of Poverty

1. The most noteable cause of intractable poverty identified by the majority, both in interviews and the training, was laziness1. This is characterised as having low intellect, 'low interest in a good fife", passivity, lack of motivation and initiative, dependency thinking, reliance on assisstance from others, and lack of life skills (to plan and organise their life), bad training and care of children by parents. It was felt by some participants in the workshop that laziness should be dealt with through education. The overall feeling was that these types of people are ho hopers' and in need of some form of assistance to survive; they do not have the abffity and life skJUs to manage alone. The wealth ranking exercise also jdentified drunkards who squandered their animals within the category of lazy and poor.
2. Lack of knowledge and good skffls in herding was also widely given as a main cause of poverty. TTus was often mentioned in conjunction with laziness, although not always. Lack of good skills was often a cause related to life-cycle stage of a household, and a problem

particularly associated with young herders begining then-herding career, and those who had not been herders during the negdel period. These were not necessarily seen to be lazy people.

3. Another reason given as a cause of poverty was the distribution of annuals at privatisation and the receipt of only a gmafl number; insufficient for effective, self-sufficient herding. This was mostly experienced by those in governement service, who were not herders within the negdel and had limited eligibility for animals. Another significant factor related to number of animals held after tranistion is the general wealth of the household during the negdel period. Some annuals were privately owned by negdel workers and so these households began with larger herds after the privatisation process, and thus were in a better starting position. Some households also found themselves in debt to the negdel at the time of privatisation and lost their share of privatised animals in repayment, and this they identified as a cause of their poverty. An historical profile of the poor in *bag* Π (see p. 6) supports the explanation that those begining the transition period with few animals have largely been unable to build up the herds since. Then- livestock numbers have continued to deplete primarily due to the need to sell or exchange animals (usually sheep) for necessary items, such as flour, rice, clothing, cash, etc. The lack of available cash to purchase these things and the reliance on traders who give poor rates, was identified as a main problem by many herders. Herders with no supplimentary skills, e.g, carpentry, saddle making, boot making, etc., were seen as particularly vulnerable to herd depletion.
4. Another cause of poverty related to life-cycle stage was identified as the traditional inheritance practice of providing animals to sons (and also daughters) at marriage, thus reducing the stock of the parents.
5. The lack of employment elsewhere and immigration of people without assets into the *sum* was also seen as a cause of poverty in the area.
6. The risk of natural disasters, such as *dzud,* was seen to be a threat to herders and could cause people to become poor.
7. The lack of a livestock insurance system was also regarded as a cause of poverty by some people.

2.1 Who are the poor?

The poor are identified by herders according to different criteria:
The poor are seen as people who have a limited herd size and composition, inadequate for self-sufficiency. This depends on the number of *bod* owned, ie., yaks, cows and horses, due to their productivity in dairy products. Sheep are given lesser productive value, although goats providing cashmere are valuable. Such households are extremely vulnerable to risk, e.g., *dzud,* and hence rapid decline into poverty. They need support from others to survive and lack cash income to acquire basic needs, such as flour, clothes, etc. They may also lack sufficient labour, e.g., in a female-headed household. Their security depends largely on the type of support system they are part of For example, a female-headed household with 50 sheep and 5 nrilkmg cows was considered poor by others (in wealth ranking exercises) because of the lack of labour. She was, however, part of a supportive kin *khot ail* who shared labour tasks. The woman also categorised herself as poor because she felt that her animals were insufficent for subsistence. Lack of labour was not felt to be a major problem since it could be provided through *khot ail* relations.

The poorest amongst the poor are identified as those who are lazy and hopeless, and unable to help themselves. They have very few animals lack the interest and skills necessary for herding. It was mentioned that they may be from poor iarnilies or kin groups, such that their poverty and sense of dependency is inherited. A significant feature is large households with many dependent children. These poorest people may also include the elderly who lack animals and kinship support.

However, criteria for the very poor also includes people who are largely found in the *sum* centre. These are people with skills and education but due to difficult circumstances are unable to find

employment or sources of income. They may be people who have migrated to the *sum* from another area without animals or those who lost a job in transition.
The main criteria identified for households to be comfortable or rich were sufficient number of ~~animals,~~ estimated at around 20 *bod* and above, and herd diversification with high numbers of large animals, mostly cows/yaks. Good herding skills, hard working, sufficient labour, suppHmentary skills and available cash for necessary purchases were also see?) as essential

2.2 Dimensions of Poverty

The interviews with *bag* governors and herders indicate that there is an increasing tendency towards poverty in the countryside.
For example, an historical profile in *bag* П shows that the number of poor has been progressively rising:
1992: 20 poor housesholds 1994: 26-1995: 30 out of 285 households, 100 of which are in the *sum* centre.
A similar historical profile done by the governor of *bag* V, indicated that those who were poor at transition have remained poor - none had been able to climb out of poverty in the 5 year period from 1990-1995 - and that the situation of others who were not poor then, has deteriorated since.
Through the interviews and a mapping exercise in the workshop, it was also evident that the majority of the poor in Chuhnit five in rural areas, e.g., *bag* V has 129 households, 26 are identified as poor, and only 3 of these are in the *sum* centre. In *bag* Ш there are 172 households, 42 of which were identified to be poor and 12 of which live in the *sum* centre (see appendix 5). During the winter season some migrate (particularly the elderly) to the *sum* centre due to the cold and to care for children attending school, and then return to the countryside the following summer. However, strong resistance was expressed by one poor household at the suggestion (by another herder) that they should move to the *sum* centre to work
There appear to be several support mechanisms which allow poor herders to remain in the countryside:

1. Poor households are supported within *khot ails* of close kin, on a basis of mutual exchange of labour and material support. These households may have only a few animals but the security of kin support is sufficient to protect them from adverse risk and sudden deterioration. Such *khot ails* tend to be stable units throughout the year, remaining together at seasonal migrations.
2. The more vulnerable poor households are those which do not have the security of a kin-based *khot ail* They may be part of a temporary or unrelated *khot ail,* with whom they stay for part of the year, moving to join or form another at seasonal migration. In this situation the degree of support provided to them by the richer households in the *khot ail* is much lower. One such herder on the list of poor informed us that they received very little support from the 6 other unrelated households in his *khot* от/, many of which were in fact as poor as his. Only one household was seen to be better off than the others, and this was also on the offical list of poor. Only in moving did they share the assets of others, ie., bullock carts. They received no official support from the *sum* or *bag,* other than some handouts of flour. When asked about support from richer households, they said that the poor could live within a richer *khot ail* but that making this arrangement was difficult, and that it only really happened within kia. They were very much left to their own devices to survive. Ibis raises the question of whether there is a tendency for poor households to form groups or *Idiot ails!*
3. Another mechanism of support' identified was the traditional and somewhat exploitative practice of poor households herding male sheep and goats for other herders. These are known locally as *khuts nkhna khariulakh1*. Two households were found to be doing this, in isolation from other *khot ails,* in order to keep the male animals seperate from female herds. During the summer months they herd the animals and in return, in the autumn they receive one young animal for every male herded Hie condition and sex of the young given is dependent on the wffl of the richer herder, such that they may receive all male young, making it impossible to breed within their own <u>animals</u> The condition of the animals is also critical, determining whether they

are able to survive the harsh winter and spring. Thus, the system benefits the richer households far more than it does the poor herder.

III. Potential remedies and solutions to impoverishment as perceived by herders and *sum* centre inhabitants

The overall feeling of herders during interviews was that the solution for poor households was restocking, although it was recognised that not everyone would be appropriate recipients. Those who should not be included were identified as the lazy and bad herders, since it was felt that they would only waste or совушие the animals. An interest was shown in vegetable growing as an alternative source of income, if training could be provided, since there was lack of knowledge in how to do this. The problem of there being many young unemployed men in the countryside was raised by an elderly woman, and it was suggested that they could be formed into groups to undertake different forms of income generating activities, such as collecting wild fruit. The problem she identified with this was one of leadership and management. She felt that this would have to be organised by the *sum* government because there was a lack of initiative, motivation and leadership amongst them and this was also insufficient at the *bag* level

A number of potential alternative income generating activities related to the herding economy were identifed in discussion with a poor household, through the use of a matrix (see appendix 4). These were rope and boot making, sewing, berry picking, sale of animal skins, cashmere, butter and dairy products. AH these activities were carried out by members of the household to provide additional sources of income and livelihood. Through the matrix analysis, the most productive activity was identified to be cashmere, followed by skins and then broom making. A seasonal calendar showed that rope making, sewing, skins and boot making can be done all year round and therefore have good potential for alternative income activities, whilst brooms and dairy production can be done for 3-6 months in the year.

The translation for this is grazing male breeding sheep and goats.

A small *bag* shop was also identified by one household as very necessary, but it was not felt that this could be done by poor herders with a loan. The logistics of transport and access to goods would be too difficult. It was felt that only the *sum* government could do this.

Other potential alternative sources of income were identified in the training workshop. These were more general and more input-intensive, including, for example, small factories, trade and the possibility of developing tourism in the area. See the Conclusions and Recommendations and appendix 2.

IV. Conclusions and recommendations of the study team

1. Characteristics of poverty

Based on the findings above the study team identified the following differentiation and characteristics of community groups in terms of poverty.

Group la. "Hopeless and Lazy", extremely poor: often Irving in *sum* centres and only able to survive in rural areas when fed by relatives, live below self-sufficiency, very few or no animals, without herding management skills or other skills for alternative income strategies, frequently drinkers, strong dependency thinking, categorized by locals as hopeless and lazy (5-)

Group 1b. Very poor with low potentials: living in rural areas or in *sum* centres, below self - sufficiency, very few or no animal Q large family size, no or only very weak kinship relations within the region, with insufficient herding management skills, and without education or skills to follow alternative income strategies, but with motivation and energy to start a new life (5-10%).

Group 1c Very poor with good potentials:

living mainly in *sum* centres, rarefy in rural area, without or with onfy weak kinship relations, immigrants who lost then- employment elsewhere, live far below self-suilloiency, very few or no animals, without good herding management skills but equipped with other skills for alternative

income strategies, however without starting capital, highly motivated upon arrival, increasing frustration (3-5%)
The difference between the three above Group 1 types lies rather in education and motivation than in current wealth

Group 2. Highly vulnerable or poor:
living at the edge of self-sufficiency, mainly in pastoral areas, requirements in terms of animals necessary to survive physically (slightly below 20 *bod)* dependent on gathering and hunting activities for subsistence, lack of cash to buy flour and other necessities thus forcing them to exchange live animals, and by doing so risking to reduce their production basis. Sufficient herding skills, however no or only weak kinship relations; big families or young/old but fairly independent operating households. Smallest economic crises can send them below self-sufficiency. important group for restocking. (10-20%).

Group 3. Vulnerable:
living in pastoral areas or *sum* centres, minimum in terms of animals or income necessary to have a secure living, dependent on gathering and hunting to have additional cash mcome. Sufficient skills, however weak kinship relations; large famffies; limited skffls for alternative income generation. Target group for restocking. (15-25%)

Group 4. Comfortable:
embeded in sound *khot ail* with sufficient bbour force, potentials for mcome diversification, cash available and sufficient animal number within *&hot ail* (30-40%).

Group *5.* Rich: (5%)

The percentage figures (given in brackets) are very rough and vague estimates, which lack any statistical analysis. They intend to give an idea of the group sizes in relation to the total population.

Impoverishment in Chubut has steadily mcreased since 1991. There was only one case reported within two *bags* where a poor household was able to improve, due to hard work. Impoverishment appears to people as a one way road.

2. Poverty characteristics and targeting of poor households

- Poverty lists drawn up annually by *bag* governors provide a sound basis for identification of the poor. The criteria used in Chuhiut *sum* were found to be comprehensive; monetary values were assigned to a wide range of activities, adequately reflecting the various income sources of herding households. In one *bag* where the team undertook systematic wealth ranking exercises the correlation between the poverty list and informants' identification of the poor was highly accurate.

- However, the official poverty statistics at *bag* level on poor households can also be misleading. In one of the two *bags* investigated 2 famffies were interviewed who did not perceive themselves as poor, but were registered as suck Taking into account the limited number of interviews the team was able to conduct this result is striking. The two above mentioned households did not infect, have many animals - the major criteria for the official poverty list - but they were well embeded ui their kinship based *khot ails,* sharing labour force and production with them

- Within kinship based *khot ails* people tend to split up into smafler units and create new households, for the purpose of statistical investigations. This enables them to save taxes, as each independent household has two *bod* of animals tax-free. According to herders information, this strategy peaked in the period before registration for the poverty programme. This, of course, has implications for poverty registration, as many new

households with smafl animal numbers were created, which in real terms stffl co-operate as production units.

- A possible option to improve the quality and reHabffity of the official poverty lists as seen by the study team - Hes in the function the *bag* meeting could play. If possible to strengthen its role and attendance by herders, this institution might have the task to approve the official poverty lists by including criteria such as isolation/self-sufficiency of household (in terms of support through relatives within *khot ail)* etc. It is recommended to further investigate this issue and the role which this institution could really play.

- Co-operation among non-relative based *khot ails* seems to be much weaker than within the latter. Therefore, households in con relative based khot ails are much more vulnerable to poverty.

- During the transition peritxt a strong tendency towards the establishment of kinship based *khot ails* could be observed. Tbe vast majority of *khot ails* visited in Chuhiut *sicm* - on a random basis were kinship groups. Ibis formation process, however, seems not yet to be completed. The study team expects that within the next few years this new type of kinship based unit *(Idiot ails)* will be more and more consolidated. Herders without kinship relations are likely to become even more vulnerable than today.

- No significant correlation was found between single-headed households and poverty. The availabtfty of labour also did not seem to be a major factor influencing poverty, as long as households are able to take advantage of joint labour within the *khot ail,*

- The traditional lifecycle appeared to be an important criteria along which poor houfveholds can be identified. Young families and households consisting of old persons are often more poor an others. The criteria is most significant in cases where the young or old families are not embeded in kinship based *khot ails.*

- Poor herders prefer staying in the herding community/rural areas to moving to the *swn* centres. They argue that the support of other herding households .in the first instance their 'own' *Idiot ail,* but also through the *neg neggoliinha* ('the people of the same valley') offer a more reliable and better support than they could expect from the *sum* centre. Strategies have to be found to identify, roach and sup-/it 10 **poor herders in the rural areas. The institutional aspect through which restocking might be implemented is therefore of great importance.**

3. Currently existing poverty related institutions

- The workshop participants identified relatives as currently the most important institution to support the poor, followed by *khot ails* and the social assistance fund (appendix 1).

- According to herders' perceptions the possibilities *of khot ails* to support needy households has reached its maximum. There seems to be no further buffer zone to support the poor through *khot* ***ails.*** The traditional pattern to support the poorest households through ***khuts*** *ukhna* ***khahulakh*** **seems** rather more exploitative than supportive (see chapter **2.2** above).

- The formation of groups of the poor was seen as a viable way to motivate and strenghten the poorest community members in the *sum* centres.

4. Restocking poor herders

- Former trials of restocking the very poorest households in Chuhiut *sum* failed. Animals were sold or lost. Lack of herding skffls on the one hand and low initiative/laziness on the other hand, were given as main reasons for the Mure. According to peoples perceptions - a new restockmg trial with this target group would probably fail again. The study shares this opinion and suggests that a new version of restockmg should rather target the vulnerable groups described above (groups Ц and Ш). The probability of finding skulful herders among the poorest group within the *sum* centres is rated low, as 'real' herders tend to remain in rural areas whenever possible.

- Poor herding households interiewed perceived a herd consisting of 8-12 cattle, 2-4 horses and approximately 25 sheep as enough for a six person household to make its living. This equals a herd of about 18-20 *bod.* Richer households tended to give higher figures. If animal numbers should be taken as major criteria for restock' households, the range of 10 to 20 *bod* (depending also on family size) might be given first priority.

- Households selected by the herding community to receive the traditional support of *khuts ukhna khariulakh* are definitely suitable candidates for restocking, as the herding community has identified them to look after their male breeding animals. This can be taken as a form of guarantee on the herding management skills of tlic poor herders concerned.

- Institutional aspect: A restocking programm would do best in integrating *bag* and *sum* levels. *Bag* govenors and herder representatives clearly expressed during the workshop their preference for the *bag* level as a focal point for restocking. They, however, were aware of the better management and monitoring capacities for a restocking programme at *sum* levsl Their major concern was rather a mistrust in the *sum. Sum* officals voted clearly for the *sum* level, stressing its management capacities and experiences with former restocking trials.

- As *bag* governors are elected representatives of the herding community, in general, they know more about the herders than *sum* officials do. Their management skills would, however, probably be insufficient to cope with complex restocking issues. A new Restocking committee' including 3-5 *sum* government representatives and afl *bag* governors as elected herder representatives, might be suitable to steer restocking.

- Training in management skills at *bag* and *sum* level might facilitate the formation process and this is therefore recommended

- As *khot ails* gain more and more importance as common production units for all of their members they seem to be the most important unit to be considered for restocking and to address the implementation of restocking. The overall number of animals and skills, etc., in relation to members within kinship based *khot ails,* should be taken as a calculation basis for poverty alleviation and restocking.

- Households isolated from kinship relations - recognizable in some cases through small numbers *ofgers* together - might need to be approached separately. In general, however, single households withm *khot ails* seem less suitable as units for restocking.

Further investigations on the formation and stability of kinship based and/or other forms of *khot ails* are recommended. They should offer answers to the question of which units are most suitable for restocking.

5. Small enterprise development

- Following the above argument on restocking target groups, alternatives should be sought, targeting the group of very poorest with insufficient herding skills. These could lie in the area of small private enterprise development. The group of the poorest without skills (Group la) could be considered as employees within enterprises, employing on a scale of 2-3 persons. Those of the poorest who have certain skills (Group Ib) might be among a group supported by the IEAD project to develop entrepeneurship. *Khot ail* leaders and *bag* governors seem to be those persons who have the knowlede about single peoples' skills

- As potential areas for small enterprise development the following were identified by herders and workshop participants: sewing, hunting, gathering of wild fruits and medical herbs, rope making, carpet weaving, boot making, carpentry, tourism (hunting, fishing, mountain biking) vegetable growing, exploitation of minerals

- Besides vegetable growing which is dealt with seperatery below, the study team sees the highest potentials for commercial activities in the areas of processing of animal products (skins), boot making, blacksmithing, sewing, hunting, carpentry and trade/transport. All these branches were perceived as areas with a high local demand Skffled persons are locally recruitable. With the exception of hunting, all these activities are independent of seasons. It is recommended to execute further in depth analyses during FAO/IFAD investigation periods on the above areas. Lack of transport facilities and lack of raw materials was seen as a major constraint to self initiatives.

- *Sum* centres seem to be the best places tor production units which operate independent of season.

A rethinking of IFADS initial budget distribution among its project components is urgently recommended. The component on small enterprise development, as well as vegetable growing (even if on a subsistence basis), needs much more emphasis than initially outlined.

6. Vegetable growing

- broad interest in vegetable growing was identified among both herders and *sum* centre inhabitants. Several times it was mentioned as a possible source for additional income generation by interviewees without having been directly addressed on this issue (peoples own idea). Currently a pilot trial in potato cultivation is being conducted by a *sum* centre inhabitant. This trial was mentioned several times by herders. They regard it as a test, to copy in case of success. However, the climatical conditions in Chuhuit (2000m altitude) are harsh. Even a success in the *sum* centre cannot guarantee overall applicability. Dissemination of further know how, and on feasibility etc., seems necessary. It could be disseminated through a *sum* cropping group which would need to be established first.

- According to the study teams understanding of the issue the mam direction of potato cropping in Chuhiut *Sum* - would be for home *consumption.* Potentials for commercial use would need further feasibility studies.

- The'fencing of crop yards will be an essential precondition for herders to realize potato cropping. The legislation and limitation on wood harvesting was seen as a major constraint for herders to implement potato growing. *Sum* centre inhabitants could grow potatoes within the fenced areas around their houses.

- Land tenure arrangements for potato fields appear to be another criteria for sucessful implementation of potato growing among mobile herder communities.

- A high potential for small enterprise development might result from the expressed and potentially rising need for hoes. Ibis could be easfly combined with the idea ofblacksmrthing in terms of oven production.

Further project inputs in terms of practical know how on cropping, and on the legislative frameworks and options in the context as mentioned above are recommended, but are dealt with elsewhere in FAO investigations.

7. Methods of field investigation

- The training workshop as outlined in appendix 7 offers a very good starting point to analyse poverty related issues and potentials for poverty alleviation as perceived by locals.

- Both mapping exercises (example of *bag* Ш map, appendix 5) as well as wealth ranking (as described for the Mongolian context by Mearns 1991) are suitable tools to identity the rural poor from a local perspective, and help to target the poor for further information. The results can be easily compared with official data.

PART V

APPENDIX 1

Training exercise of matrix scoring

Group # 1. Group consisted of head of governor's office, population inspector, doctor and *bag* herders

Best institution for supporting poor in Chuluut *sum*

Institution Criteria	Relatives	Social assistance fond	Collective of poor	Company	Inter-national agency	Khot ail	Bank	Red cross
Good under-standing	5	3	3	1	2	4	1	2
Fight trust	5	3	3	2	3	4	1	2
Financial capacity	1	4	1	1	4	3	5	3
Fight capacity to provide needs	5	4	1	1	4	3	5	3
Capacity for long-term support	5	2	2	1	1	3	1	2
Total	21	16	10	6	12	16	9	12

Note: These participants concluded that the ° best institution for supporting the poor is relatives". Next were the social assistance fund and *khot aU.* During the discussion they identified one new

institution, this was groups or collectives of poor people. It was felt that if poor people built their own groups or collectives, this would provide useful support. When asked why, they answered that the poor can understand each other and their own situation more clearly than others. In future, if people combine the supportive activities of *khot au* and relatives with groups they will be successful. In their opinion, support to the poor should be given directly and not through intermediate levels.

APPENDIX 2

Group #2. Group consisted of governor, deputy governor, accountant, tax inspector and herder.

Source of income generating in Chuluut *sum*

	Livestock husbandry	Natural resources	Hunting	Growing vegetables	Carpentry black-smith	Small factory	Trade	Tourism	Using scrap materials
Availabffity of required resources	5	5	5	2	3	. 3	4	5	2
Less expenditure	5	4	3	2	1	0	1	3	2
Less demand of labour force	3	4	3	3	4	3	4	4	4
Less need for technicalinputs	5	5	4	3	2	2	1	3	1
Capacity of income year	5	4	3	1	0	1	4	1	0
Capacityof reliable income	5	3	3	1	1	2	2	2	1
Less de-mand of qualification	2	5	5	2	1	1	4	1	5
High level of ccnsmnption	5	5	5	3	3	4	2	5	1
Total	35	35	31	17	15	16	22	24	16

Note: Participants in this group were mostly *sum* officials. They identified the general resources of income generating in the *sum* and concluded that livestock and natural resources had the highest potentials for income generating activities. Before doing the matrix analysis they felt that tourism had a lot of potential, but after identifying important criteria, they found that livestock, natural resources and hunting were preferable.

APPENDIX 3

Group # 3. The group consisted of: 3 *bag* governors and 3 herders

What institution can best facilitate restocking

Item Criteria	Bag	Company	Rich people	Bank	Sum	Foreign organization	Relatives	Khot ail
Access to credit	8	2	1	9	10	0	1	1
Effective use of credit	7	3	8	5	1	0	5	6
Better cooperation	9	0	0	0	0	0	6	10
Who can get the cheap livestock	9	0	4	0	0	0	8	10
"Who can get the more productive livestock	9	0	0	0	0	0	5	10
'Whom can the poor trust	10	0	5	0	1	0	3	8
Who can best manage a restocking programme	8	0	0	0	5	0	0	0
Who can best monitor the implementation	10	0	0	0	9	0	0	7
Who knows best the poor	10	0	0	0	9	0	8	7
Total	80	5	18	14	35	0	36	59

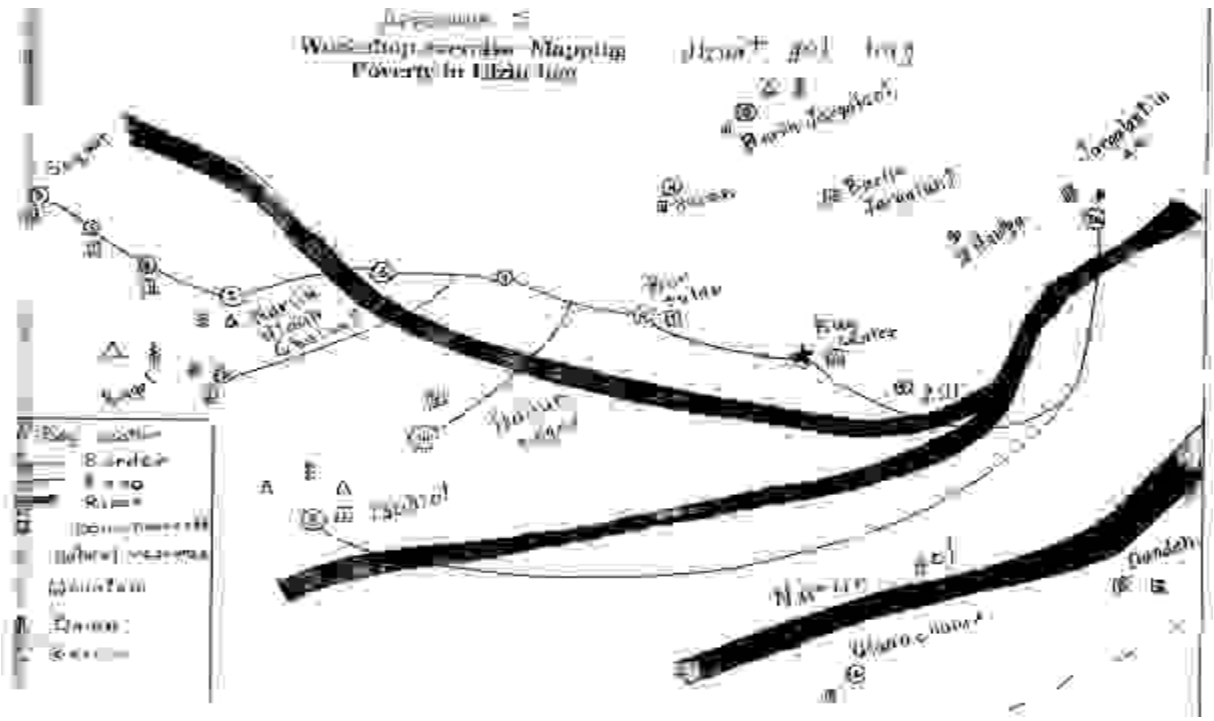
Note: Other workshop participants stated that most of the participants in this group were *bag* governors and herders, and for this reason they gave importance to the *bag* level. The *sum* governor summarised, "Previously, we restocked the poor twice through the company, using the capital of the negdel. But now the government is responsible for the poor not the company, and for this reason the restocking must be organised by government. *Sum* and *bag* are both local institutions of government, but the *sum* has more potential for organising, monitoring, and managing. The best institution is *sum* lever.

APPENDIX 4

Household income generating activities identified by poor household in *bag%* 5 of Chuluut sum

Activities Criteria	Rope making	Broom making	Dairy products selling	CashmereselKng	Sewing	Making Mongolian boots	Berries	SeTKng skin
Low price of raw material	10	9	10	14	8	4	8	10
Easier tomake	1	5	1	4	1	1	5	6
More benefit	3	3	1	4	5	5	1	5
Have good market	8	4	2	9	4	7	3	6
Less labour required	3	8	2	3	8	2	2	8
Total	25	29	16	34	26	19	19	35

Note: This matrix, drawn by a poor but skffled and active family, clearly shows the Importance of supplementary skills to the income of poor herders. Rope, broom and boot-making, sewing and berry picking, can all be undertaken by rural families without substantial technical or material inputs. In contrast, a second level of income-generating acdvity covering carpentry, blacksmithing and hunting require higher inputs and are therefore practiced by better-off households.



APPENDIX 6

Workshops participants

Arkhangai aimag. Chuluut *sum* from 28 to 30 august.

1.	Dashzeveg	governor
2.	Balgansuren	head of governor's office
3.	Baljinnyam	deputy governor
4.	Machgalsuren	bag 1 governor
5.	Mijiddorj	bag 2 governor
6.	Biziadorj	bag 3 governor
7.	Ganbaatar	bag 4 governor
8.	Tsetsejmaa	doctor
9.	Batdorj	nature protection inspector
10.	Byambasuren	social insurance inspector
11.	Selenge	representative of poor in sum center
12.	Davaasuren	herder
13.	ZuK)chir	herder
14.	Mijiddorj. O	tractor driver
15.	Batjargal	accountant
16.	Tsetsgee	tax in spector
17.	Dulmaa	population inspector
18.	Khandsuren	herder
19.	Batbaatar.C	herder
20.	Danzansambuu	herder

APPENDIX 7

PRA workshop agenda (2 ½ days)

Day 1

- Intoruction – Sum governor; participants
- Objectives and context of workshop
- Introduction to PRA:
  - History
  - Feastures
  - Principles
  - Methods
  - Context of PRA in Mongolia
- Practical Session: Attidudes and Behavior
- Practical Session: Semi srtuctured Interviewing skills

Day 2

- Review of previous day
- Practical Session: Mapping
- Practical Session: Matrix scoring

Day 3

- Session: Sessional calendar and daily routine on gender
- Practical Session: SWOT analysis group exercise
- Final discussion and summary

ANNEX 2

LOCAL GOVERNMENT AND NONGOVERNMENT ORGANISATIONS

Batbuyan

1.Introduction
2.ArJchangai aimak
3.Local organizations which operate in rural areas of Arkhangai aimak.
- a). Company/khorshoo
- b) "Knot ail"
- c) "Bag "

4."Neg nutginkhan"
- a) "neg nutginkhan" traditional unit
- b) present situation

5.Movement, land tenure
- a) movement of herders in high moutain and steppe area
- b) "otor" form of pasture use
- c) land tenure, management: role of local instution as "khot ail", "bag","neg nutginkhan"

6 Social economic situation and role of local institutions in development.
7.Restocking programme. Organisation of restocking programme.
8. Conclusion.

1. Introduction.

In period of transition to the market system in Mongolia more come problem on poverty and specialy in rural areas. For the solution this problem in rural area will restocking poor household. And important question from this coming through which instituion it could be realizated. The field work is show that such instituion could be strong "khot ail" and local administrative unit bags. The economic instituion as a company and khorshoo with present structure could not take part on restocking program.

Main problems of rural population is shortage on social and economic service. And all this problems could not done by only "khot ail" as try to do at the present time. In reason of small size of khot ail in solution of these problems. Therefore need to have strong local instituion as been in past "neg nutginkhan". This unit is on the early stages of reestablishment in some part of Arkhangay aimak.

2. Arkhangay aimak.

Arkhangai aimak is bounded by the Khangai mountain area
to the south, west and north and encompasses a territory of more then 55000 square kilometers. Population of aimak more then 90 thousand. The population density of Arkhangai aimak is one of the densest in rural Mongolia with more than 1.5 people per 1 km squ. (about 30 % more dense than the average population density in Mongolia (1993)).
The averige elevation in Arkhangay is 2160 m above sea level and the highest place is Kharlagtai Saridag mountain (3539 m) in Ikh Tamir Sum.
The rivers such as the Nouth, south Tekhi gol,Gichinnii gol, Suman gol, Chuluut, Khangai, Nouth, South Tamir gol , Orkhon gol originate at the top of the Khangai mountain and flow north and east to the steppe, providing suitable area for grassing pasture. More then 20% of territory of Arkhangai aimak is forested. Forests grow mostly on the nouth slopes of rnoutains; south slopes offer suitable territory for hay-cutting and grazing.

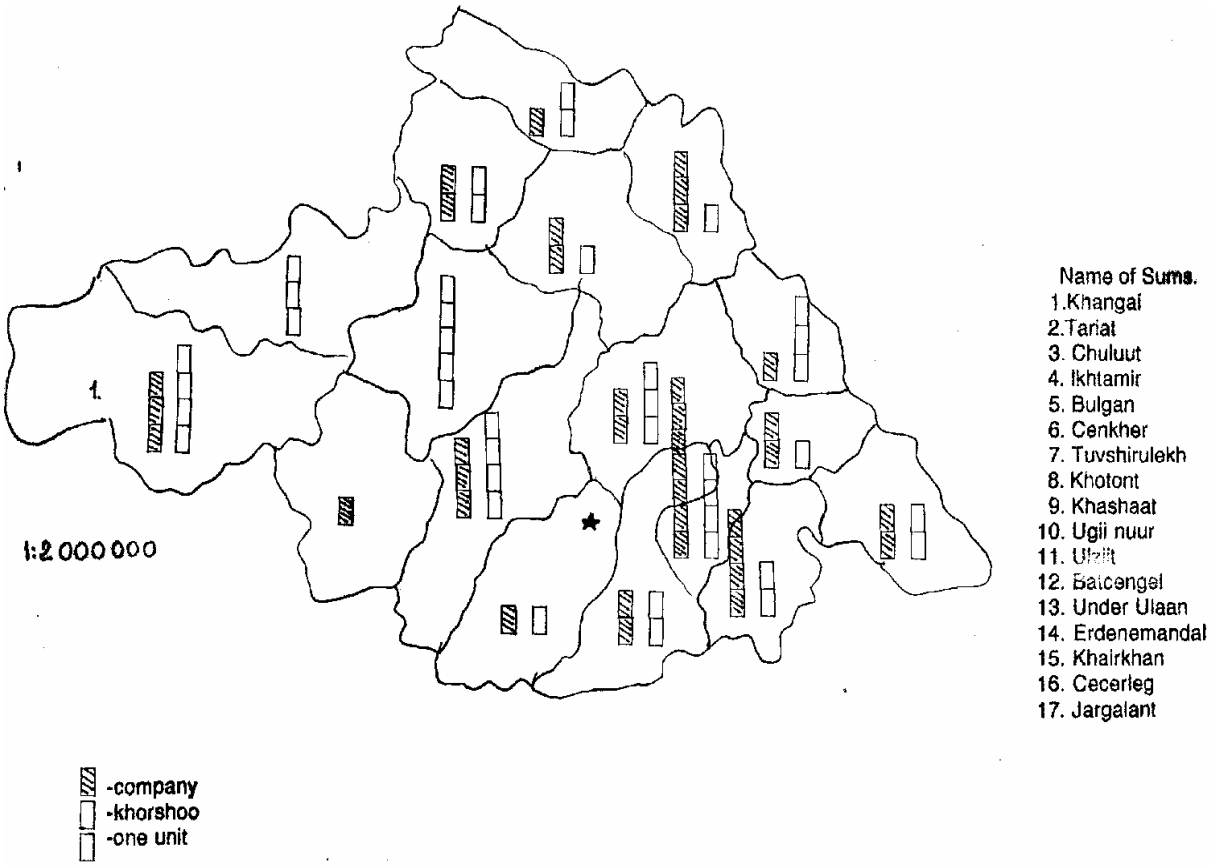
Arkhangai aimak is asuitable aimak for developing agriculture, including both cultivation and pastoral livestock production. The aimak has 1494685 animals (camel-1020, horse-189363, cattle-284126, sheep-785216, goat -234960).

The territory of aimak includes two ecological zones, the mountain-steppe and steppe area. Khangai, Tariat, Chuluut, Ikhtamir, Bulgan, Cenkher, Under ulaan, and Jargalalnt Sums are located in the mountain-steppe zone. The remainder, including Khotomt,Khashat,Ugiin Nuur, Tuvshiruulekh, Ulzii sums, are located in the steppe *zone.*

3. Local organizations and institutions.

Three types of organizations and institutions operate at the local level: state organizations such as sum and bag administrations, economic organizations such as companies

Map N 1 Number of companies & khorshoos in Arkhangai aimak



3.1. Company/khorshoo.

Arkhangai aimak records 631 economic units, 46 (7.2%) companies, 81 (12.8%) khorshoos, and 504 (80%) private enterprises.

Companies and khorshoos at the present time have similar structures and roles in rural areas, but differ in the amount capital. Companies are bigger then khorshoos. (In this paper I will refer to companies and khorshoos as company/khorshoo.)

Number of company/khorshoos per sum in Arkhangai aimak vary widely aross the Aimag, ranging from 0 to 7 company/khorshoos per sum. (see Map N 1) These variations depend largely on the ecological zone, which influences company operations and access to markets. In some sums, unsuccessful company/khorshoos have closed down.

Most companies and khorshoos have similar
organizational structures, including a director, accountant, and workers. They vary in the number of workers, membership structure and property (capital assets). As an_ example we compare the Dashbanzad company of Ikhtamir sum and Chimgelt company of Batcengel sum . The Dashbansad company has 10 workers, 75 members (59 herders), 1 tractor, 1 lorry and a total 201 livestock (21 cows and 180 sheep). Chimgelt company has 39 workers,1260 members, 2 tractors, 2 lorry and 1978 animals (38 camels, 1425 horse, 50 cows, 1427 sheep, and 438 goats). The company also possesses 800 ha of cultivated land of which 350 ha were used this year. Dashbanzad company specialises in small factory of wood processing and production of flour products, trade and service, while Chimgelt company specialises in agriculture, hand carpets and also trade and service. The main reason these differences is ecological location. Chimgelt company is located in the steppe zone with land suitable for cultivation while Dashbanzad company which is located in a high mountain area (where there is potential for wood product production). Thus we see some kinds of specialisation which result from the different ecological conditions in which companies operate. Steppe area companies focus on agriculture while mountain area companies specialize in wood products. But all Arkhangai company have similar emphases on trade, service, and small production.

Some companies, as a result of poor management, have failed to cultivate connections with local herders and consequently have difficulty obtaining livestock products for trade. Some are specializing in enterprises, such as vodka manufacturing, that have little to do with livestock production at all.

The level ecomonic organisation in company/khorshoos is very low.
domination of own interest of company unther membership and rung operation. The reasons of low operation is not correctly management (price of livestock production, marketing etc)of company.] In its first year the companies established a small trader-shop in each bag, but as a price of goods offered was always high compared to local low prices for livestock and livestock products, herders chose to sell their products to private traders from the city and amok center. This led to a significant drop in the overall trade with and services to herders. Following this situation,, the same companies tried to spread their impact over the local market in order to reduce the presence of incidental visiting traders. The number of herder members in the companies is decreasing because of disappointing terms of trade and poor services. As a result, these companies have dissolved.

Similar situations have occurred in other sums. Herders perceive no benefit to being a member of a company/khorshoo. It makes no difference if we are members or not, is the general comment by herders.

Because the scope or radius of services is small, in most cases only herders near sum centers have access to the services provided by a local company. Operation and delivery of services is entirely seasonal. Trade occurs at fixed times of the year when certain types of products appear—milk, cashmere or wool, for example. Trade takes place on a barter basis. Often herders mprovide their products up front and must wait for the company to sell them in the city before they receive their payment in goods. When payment is delayed, as happens frequently, herders blame the company for poor management (even when the delay is the fault of the buyer in Ulaanbaatar). In many areas an important barrier existing between herders and companies is trust.

History:
In 1992 the negdel in Chuluut sum reorganised into two companies, “Cort sumber” and “Chuluut,” which dissolved after one year due to poor management. [Main reason

Despite the problems with companies/khorshoos, in some areas (Battsengel and Tsenkher Sums) herders still believe that a company could play an important role in getting their products to the market. They blame current difficulties on mismanagement rather than an inherent flaw in the institution. They would like to remain members of the company. In explanation they used the following example. If a herder urgently needs something like flour, only a company would sell him flour on credit on the basis of his membership status. Private traders will not provide credit in emergencies. In this way companies may function to reduce risks to herders.

In conclusion, economic entities such companies/khorshoos at present have little influence in rural areas. However, companies/khorshoos still have the potential to play an important role in the economic development of rural areas.

Table N 1. Number of company and khotshoo in Arkhangai

name of sum.	total.	Company	Khorshoo	private
1. Ikhtamir	30	3	4	23
2. Chuluut	2	1	-	1
3. Khangai	17	3	4	10
4. Tariat	11	-	3	8
5. Under-Ulaan	9	-	5	3
6. Erdenemandal	20	2	1	17
7. Jargalant	11	2	2	7
8. Cecerleg	5	1	2	2
9. Khairkhan	4	3	1	-
10. Batcengel	22	2	3	17
11. Ulziit	22	1	3	18
12. Ugiin nuur	7	2	1	4
13. Khashaat	7	2	2	3
14. Khotont	17	4	2	11
15 Cenkher	17	2	2	13
16.Tuvshruulekh	32	7	4	21
17. Bulgan	9	1	1	7
18. Erdenebulgan	384	9	39	336
19. Cakhir	5	3	2	3
Total	631	46	81	504

3.2. “Khot ail”

After privatization and the dismantling of negdels, most herders became private herders and organized into informal residential groups locally known as <khot ail,> which are in most cases are based on kinship relations.(as parent -children’s)

History:
For centuries Mongolian herders have used cooperated with one another in pastoral livestock managment. One of the main forms of cooperation was the “khot ail.” Each household needs a range of livestock species to meet consumption needs (including transportation, wool for felt, meat, milk etc) but the labor requirements of keeping a diverse herd are heavy. Thus households began to cooperate among themselves, pooling herds and sharing labor. In addition, since khot ails typically contain member households of different stages in the household lifecycle, this type of living and working arrangement facilitated the sharing of knowledge among generations.

This system of cooperation was disrupted during the negdel period and only reappeared after privatization. The reestablishment of khot ails was not a conscious revival of a traditional institution but rather a natural social consequence of the labor demands, economic and ecological structure of private pastoral production in Mongolia.

Currently khot ails are based primarily on joint camping and sharing of herding tasks. (Table N 2. Seasonal calendar of herders in Ikhtamir of Arkhangai amok.) From interviews it is clear that this institution at the present time has two different meanings. Of 56 herders interviewed 21% explained "khot ail" as a unit consisting mostly of related families that shares labor through a scheduled labor division of herding tasks. Sixty-seven percent said that in addition to sharing labor, knot ail members jointly market their products. Only 12% could not answer the question.

I refer to these two types of knot ails as "modern" and "traditional" knot ails with the following definitions:

-A modern knot ail is a group of relatives that join their labor and sell their own products to market.

-A traditional khot ail is a mixed group of relatives and friends that share labor for livestock herding and other production tasks.

Although a large number of herders explained khot ails as having-g a marketing function, only a small proportion of khot ails actually engage in joint marketing activities. One reason for the wide perception of khot ails as a marketing unit may be the use of the term "khot ail" on the state radio to refer to groups of herders engaged in small enterprises. Possibly the state is trying to promote the knot ail as an economic entity to assume many of the previous functions of the collective. In the opinion of this researcher, this role is inappropriate and unviable for a unit as small as a khot ail. The khot ail's role is more appropriately the traditional sharing of herding, hay-making and other domestic tasks and mutual assistance among member households.

Out of 42 khot ails in Builan Bag, Tsenkher Sum, eight khot ails marketed jointly marketed member households' products in Ulaanbaatar. The main criteria for engaging in this type of joint marketing is that at least one member of the khot ail must have a relative living in Ulaanbaatar who can inform the khot ail about market prices and outlets, and who in many cases organizes most aspects of the marketing operation. The second main criteria is access to the transport, in most cases private ownership of a truck. Some very wealthy khot ails may be able to contract and pay for shipping.

The following case study is an example of a khot ail that jointly markets its livestock products. The khot ail consists of four households:

1. Sambuu (80 yrs) , father, head of khot ail,3 member of family livestock: horse-7, cattle-13, sheep-77, goat-15
2. Battulga (30 yrs) son, 4 member of family livestock: horse-18, cattle-13, sheep-68, goat
3. S.Ganaa (33 yrs) son, 4 member of family, driver of tractor of company. livestock: no information as he from other bag
4. Sanjaa (40 yrs} son, 9 member of family livestock: horse-25, cattle-12, sheep-49, goat-36

One other son (Sakhiajab)is a driver who lives in Ulaanbaatar and who organizes the marketing. For example, Sakhiajab locates a buyer for cashmere in Ulaanbaatar at a favorable price and arranges for his brother Ganaa, also a driver, to deliver the products to the city. Sakhiajab also organizes purchase of goods for the khot ail's own consumption and sometimes local trade. Ganaa's tractor is officially owned by him, although he has not yet paid off the wholepurchase price to the company. In 1994 the khot ail made two marketing trips to Ulaanbaatar and sold more then 100 animals, 30 kg of kashmir, 200 kg of wool.

a/ size of " Khot ail "

The size of khot ails varies depending on the number of animals per household, the type (mountain or steppe) and the condition of pasture, and the season. In good years the number of households per khot ail is larger than in bad years. A large khot ail may split into two small khot ails during the milking season (sakhalt) in order to exchange lambs for grazing during the day.

The number of household with in khot ail a different (see Table N 3.4) . Date from the Ikhtamir sum is showing that in winter more then 44.4% of khot ail is computed by 2-3 households

and only 1.8 % by the 10-11 households. In Chuluut sum we see that most of khot ail 27.2% have 6-7 households and 4.5% by more then 12 household. Reason of such differences is number of livestock per household.

Table N 3. Erdene tolgoi bag of Ikhtamir sum (winter camp)

number of household within khot ail	number of hot ail	%
1. 2-3	24	44.4
2. 4-5	17	31.4
3. 6-7	9	16.6
4. 8-9	3	5.5
5. 10-11	1	1.8
6. 12 more	-	-
total	**54**	**100**

Table N4 Zuun mod bag of Chuluut sum (winter camp)

number of household within khot ail	number of khot ail	%
1. 2-3	3	13.6
2. 4-5	5	22.7
3. 6-7	6	27.7
4. 8-9	5	27.2
5. 10-11	2	9.0
6. 12 more	1	4.5
total	**21**	**100**

1) *Size of khot all in Arkhangai amok is different in different ecological areas.* Main different is coming between mountain and steppe area. In high mountain area size of khot ail is more bigger then in the area of steppe region. Number of livestock per household have main influence on number of households with in khot ail. If in moutain area as a Ikhtamir sura (Erdentolgoi bag) in average herders have horse-33,cattle-41,sheep-126, goat-12.the "khot ail" size could be bigger in summer up to 5-7 household. When herders from the steppe area has horse-47, cattle-53, sheep-203, goat-61 (Batcengel sum, Khonog bag) would have with in "khot ail" in summer only 3-5 households.

2) Size of khot ail is changes seasonally. If in summer, number of household grows up to 12 in mountain area and 5-6 in steppe area, in winter are reduces up to 4-6 in mountain and 2-3 households in steppe area.

3) Size of khot all is depend *of weather shorten years.* In summer of good year number of households with in khot ail is bigger the usually years and opposite in bad years (drought) number of household with is khot ail is lower.

4} *Size of khot ail* is *changed year by year.* Such changing size of khot ail observed in summer season when to the stability "khot ail" is come one or two "ger"s which is usually brothers and sisters or parent who are lives in sum or amok centre. They are visiting relatives of rural area during the summer and leave in beginning of autumn. Therefore Number of households with in khot ail are grows and grows on more then 20-30% size of "khot ail" . (bag leader of Khonog bag of Batcengel sum }.

Therefore the size of khot ail in Arkhangay amok a different in different ecological area and size is mainly depend from number of livestock per household and pasture avaibile. But in winter and spring seasons size of khot ail is always same and only in summer/autumn have some changes.

b/ Structure of "Khot ail"

"Khot ail" is mostly case build on the basis of kinship. For example the structure of 59 khot ail of Erdenetolgoi bag of Ikhtamir sum 54.2% is on the basis of related household.

a) full kinship relation people of khot ail -15 (25.4%)
b) half of kinship relation people -32 (54.2%)
c) friend, familiar -8 (13.3%)
d) single household -4 (7.1%)

The structure of half of kinship related herders of khot ail is following (khot ail of Cerendagva of Bulgan bag in Cenkher sum.)

1. Cerendagva (55 old) 7 member of family, leader of khot ail livestock: horse-13 cattle-20 sheep-30 gcat-50 2.Cerendendev (79}
2. friend of parents of leader of khot ail livestock: horse-5 cattle-24 sheep-49 goat-60
3. Janjivdorj (35) *1,* relative of leader of khot ail livestock: horse-11 cattle-12 sheep-20 goat-50
4. Batochir (29) 4, son of leader of khot ail livestock: horse-3 cattle-6 sheep-10 goat-7 S.Bumanduu (30) 4, son of leader of khot ail livestock: horse-Q cattle-2 sheep-5 goat-8 G.Batjargal (23) 3 , son of leader of khot ail livestock: horse-3 cattle-6 sheep-14 goat
5. Her we have typical structure of khot ail at the present time where predominated kinship as a father and sons.

Some khot ail also have different structure wealthy status of households within a khot ail is different although hey relatives. Some khot ail is a mix of rich and poor and some of the khot ail are completed by poor household. For example, in Khokh Nuur bag Ikh tamir sum a sample of poor "knot ail" have following composition: Leader of the khot ail is sun of Yanjima.
Yanjima (60 year)-single women with 4 children livestock: cow-5, sheep-10 Bayarbaatar (32 year) - son, 5 members in his family, leader of khot ail. livestock: horse-32, cow-27,sheep-20,goat-30 3.Erdentsogt(40 year) - son in law of Yanjima livestock: cow-5 sheep-5 4. Zayatai (50 year) - son in law of Yanjima livestock: cow-2, horse-2, sheep 10.
The numbers of such khot ails which is completed by the poor household with in bag is very low as 4.6% in Khokh nuur bag of Ikhtamir sum, Builan bag of Cengel sum.

At the present time most of "khot ail" in Arkhangay amok is completed by relative close people which is parent, brothers and children's, or son in law or friends. Therefore khot ail is very stability unit and very strong.

3.3. Bag-administrative territorial unit of sum.

Each sum of Arkhangai amok is dividing on small administrative unit call "bag" where in average have 150-250 households of population. The territory of bag have big vibration as in some bag for example khonog bag of batcengel sum have 70460 ha, when Khurmen bag of Chuluut sum only 17300 ha. Each bag unit have bag leader which is elected by the local herders on bag khural for the 4 year. The administration of bag is following: bag leader, doctor of bag and veterinary of bag.

Bag leaders is person in local community who knows all people and very well informed about social problems of local herders. Bag leaders goes to visit each households of the bag one time per month.

In some area like for example in Tuvshiruulekh sum bag leader of 1 bag organized training course for the few local younger herders on making "tereg" cart.

But in general at the present time the bag leader have following role:

a) to inform membership of bag about political economical dissuasions of government.

b) to collect tax each seasons organize a one meeting to discuss about problems which is coming. (seasonal pasture use, hay cutting, shearing)

c) regulate conflict about pasture and use pasture.

Following this list of work which doing bag leader we see how important role have bag.

But from interview with bag leaders and herders of different sum I find that a leader at the present time have one main same problems which is do not having economic right to take active assistance on social and economies activities on live of herders. [During the collective period brigade leaders had small discretionary funds which they could use to hire labor for special purposes, give rewards and incentives, etc. They also had authority to direct herders' production activities
such as instructing herders on the amount of hay to harvest, where and when to change pasture, etc.] Nonetheless, leader of bag has big influence of herders live, and really power as example with right to regulate seasonal pasture.

4. "Neg nutginfchan"

Other unit which is on the way of establishing is groups formed by herders themselves "people of some local river or valley ", but we will call them "neg nutginkhan" This is an informal organization.

"Neg nutginkhan" is a group of herders who use the same land and are referred to locally by the name of a valley or river (or other prominent local geographic feature). Neg nutginkhan literally means "the people of one place." This group is not organized at the initiative of an individual or group, rather it emerges out of the shared lives, livelihoods and resource base of a group of neighboring households. The emergence/creation of a neg nutginkhan depends first of all on joint use of an "ecologically suitable territory." An ecologically suitable territory for extensive livestock production is an area of land bounded by natural borders (such as a river or mountain range) that encompasses the necessary range of seasonal pasture resources and pastures suitable for all species of livestock. Joint use of an ecologically suitable territory allows herders to maximize livestock production and use pastures efficiently and sustainable (e.g. undertake proper seasonal movement and pasture rotation).

Based on historical materials and interviews with herders we propose the following model to illustrate the historical role and structure of neg nutginkhan. (See Figure 1.) Neg nutginkhan consisted of up to about 150 households (20-30 knot ail) which were further subdivided and organized into smaller neighborhood groups (neg usnikhan—people of one water) consisting of 20-25 households(3-5 knot ail). Neg usnikhan used the same seasonal pastures, jointly made make felt and gathered fuel, and participated together in trading with other groups within a small radius. The neg nutginkhan had a small settled center that usually consisted of a temple and was the administrative center for the bag (the smallest administrative unit of a khorshoo). Households within a negnutginkhan traded among each other and jointly traded longer distances (for example to Urga or Beijing). Within a neg nutginkhan individuals or small groups might specialize in handicraft production, such as saddle or carpet-making. Other specialized occupations within a neg nutginkhan included traders, healers, teachers etc.

In other word this was been country with in country.

At the present time in some areas of Arkhangai airnak such small informal group of herders as "neg nutginkhan" is on the early stages of reestablishment. In some areas this process is going faster and in others more slowly or is not yet started. But this type of organization is developing more

Figure N 1. Structure of tradutional informal social & economic unit • “neg nutginkhan”.

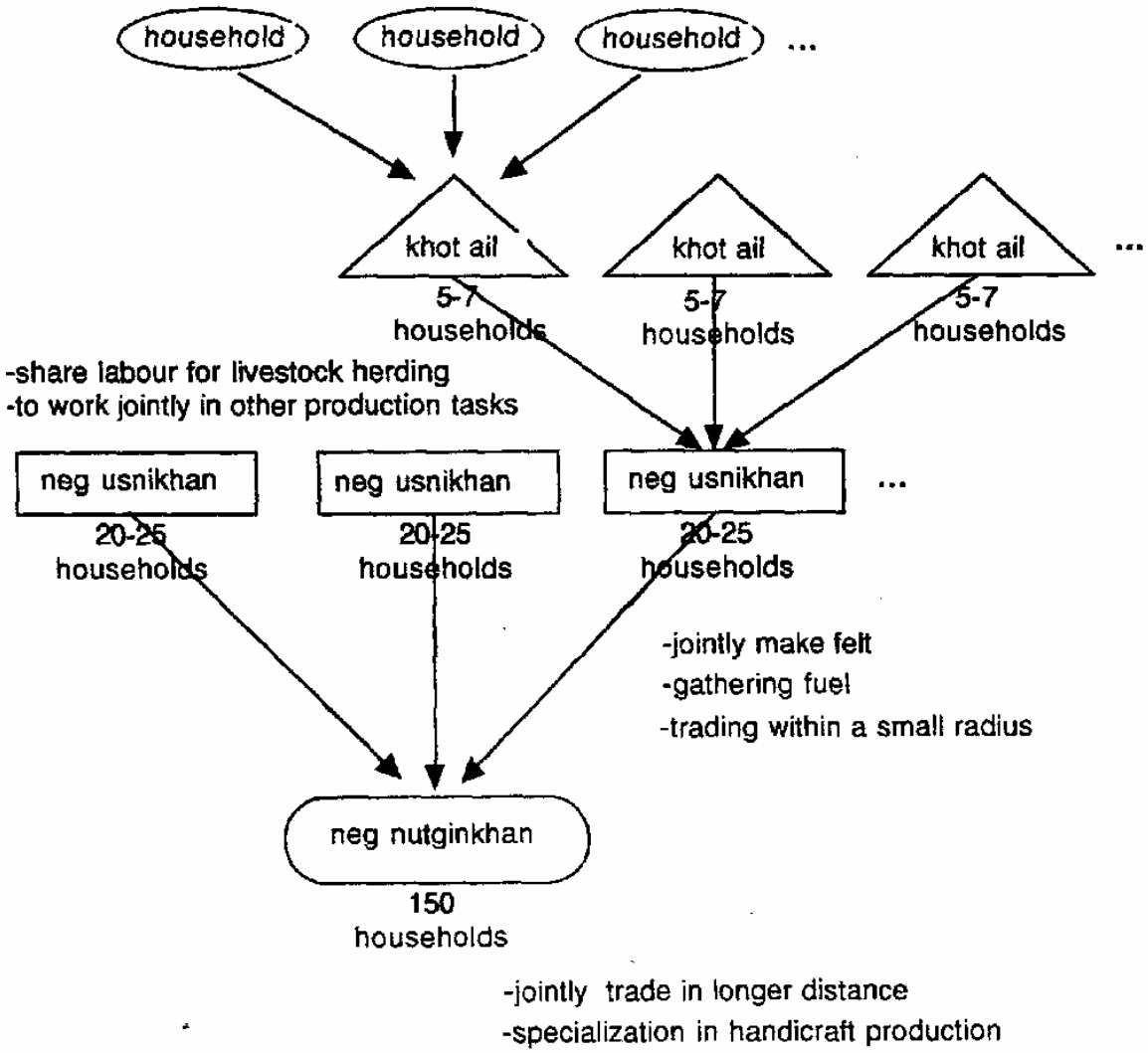
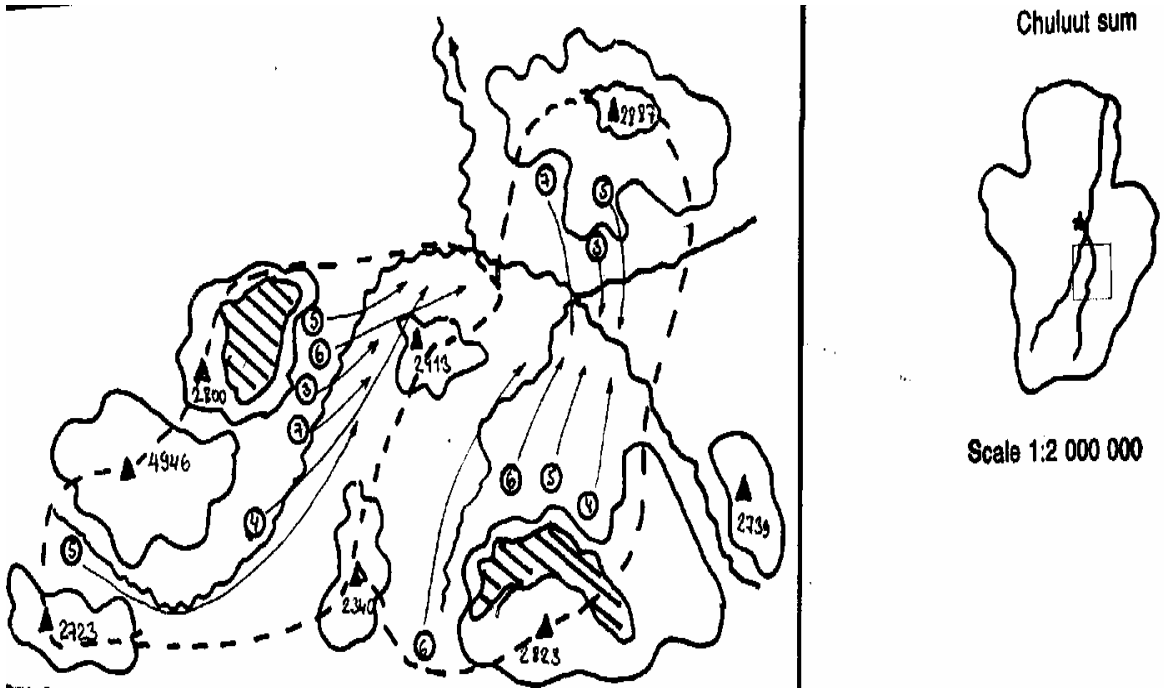


Figure N3 Location of neighborhood groups in Khangai bag of Chuluut sum



2. INPUTS

2.1. Printed information. For each vegetable a one sheet document giving cultivation, storage and processing information.Written in simple language and given / sold the first time seed of any vegetable was purchased.
2.2. Seeds. Substantial imports of potato seed are needed to improve the quality of locally produced seed which has not been changed for many years. Russian seed of a suitable variety and certified quality, should comprise the bulk of the imports. Some Northern European and Chinese varieties should be imported for trials, with special emphasis on 90 day yield and Phytophera resistance. Cabbage, turnip and carrot seed are widely available in Mongolia and the existing varieties are suitable for Arkhangay conditions. Beetroot, Chinese cabbage and green bean seed of suitable varieties should be imported for trial here. Onion sets for the production of bulb onions should be imported, preferably from Russia or Northern Mongolia
2.3. Tools. Rakes and hoes manufactured in Mongolia should be made widely available. A small number of push hoes and hand drills should be imported to test their suitability under Arkhangay conditions.
2.4. Clear polythene sheeting. To be used for covering crops in the Spring. It will enable sowing dates to be brought forward two weeks and provide some protection from late frosts. Rolls are available in Ulaanbaatar, 1.4 metres wide and 0,2 m.m. thick. It is estimated to have a life of three years.
2.5. Barbed wire. Five rows of wire 20 cms. are suggested where protection from livestock is needed. It is estimated to have a life of 20 years.
5000 copies
Price tgs/kg 150 17000. 13000. 1000.
9000
9000. 13000.

2.6 Estimated Cost of Inputs as at 22-8-95

Information sheets		5000 copies	4500000tgs…
		Price tgs/kg	
Seed.	Potatoes	150	Imported 250 tgs/Kg.?
	Cabbage	17000	
	Turnip	13000	
	Onion sets	1000	
	Stem onion seed	9000	
	Chinese cabbage	9000	
	Beetroot	13000	
Tools	Hoe	500 tgs	
	Rake	750 tgs	
	Push hoe (imported)	40.000 tgs	
	Hand drill (imported)	60.000 tgs	
Clear polythene sheeting		120 tgs/square metre.	
Barbed wire (Imported)		8000 tgs/200 metre.	
Posts		200 tgs each.	

1. PLAN FOR A FAMILY UNIT OF 240 SQ. METRES IN AN URBAN AREA

Proposed cropping

	Area Sq. metre.	Anticipated yield T/ha.	Plot yield. Kgs.
Potatoes	160	15	240
Turnip	40	20	80
Stem onion	20	20	40
Cabbage	20	60	120

Yields are higher than the Arkhangay average but yields similar to these are already being achieved by the more successful growers. For a family of four this will give all of their theoretical potato and vegetable requirements, by selling some of their vegetables and buying flour the family could raise cash without reducmg the families calorie supply.
Cultural details. It is assumed that 1 ton of sheep manure will be applied annually and 50 sq. metres will be covered with clear polythene. An insulated store of 0.5 cubic metre will be needed.
Financial Details. It is assumed mat 1 ton of sheep manure will be provided free and all labour requirements provided by the family.

Value of Produce

	Quantity Kgs.	Tgs /Kg.	Tgs
Cabbage	120	120	14400
Potatoes	240	100	24000
Turnip	80	130	10400
Stem onions	40	150	6000
Total			54800

Expenses
Seed.

	Quantity	Tgs /100 gms.	Tgs.
Cabbage	5 gms.	1700	85
Potatoes	40 Kgs.	15	6000
Turnip	25gms	1300	325

Stem onions	40 gms.	900	360
Total			6770

Tools 1350 tgs written of over 3 years	**450**
Polythene 6000 tgs written off over 3 years	**2000**
Total annual expense	**9220**
Annual "profit" (NO allowance for family labour and rent)	**45580**
Capital requirements	**14120**

4. PLAN FOR A 0.5 HA. COMMERCIAL UNIT..

Cropping

	Area Ha.	Yield T/ha.	Yield Kgs
Potatoes	0.25	10	2500
Cabbage	0.10	15	1500
Turnip	0.10	15	1500
Bulb onion	0.05	10	500

Cultural Details.Yields are above Arkhangay average but well below those being achieved by the better growersThese areas will usually be close to the Sum centre and will therefore need fencing, allowance has been made for the purchase of 2,700 metres of barbed wire. 25 tons of sheep manure will be needed annually and an allowance has been made for the transportation of this. 200 sq. metres of turnips and potatoes will be covered with polythene annually. Ploughing and leveling of the land will be carried out in the Spring by a contractor. All other cultivations will be done by hand or using a push hoe. Cabbages will be reared initially in a cold frame , heated by decomposing sheep manure and planted out in June. Produce will be stored in small private stores controlled by the grower. The unit will provide full time employment for one family and one casual worker.

Financial Details

All potato seed purchased in first year, thereafter half home saved.

Value of Produce

	Quantity Kgs.	Tgs / Kg.	Total Tgs.
Potatoes	2500	100	250000
Cabbage	1500	120	180000
Turnip	1500	130	195000
Bulb Onions	500	250	125000
			750000

Costs

Seed

	Quantity	Price	Total Cost
Potatoes	625 Kgs.	150 Tgs/Kg.	93750
Cabbage	100 Gms.	17 Tgs / Gm.	1700
Turnip	600 Gms.	13 Tgs /Gm.	7800
Bulb Onion Sets	40 Kgs.	1000 Tgs/Kg.	40000
			143250
Labour	1 man for 5 month		75000
Cultivations	Hire of tractor and cultivator.		20000
Transport			**100000**

Tools	45000
Polythene	24000
Sacks	10000
Total	79000

Written off over 3 year	26300
Total	**364550**
"Profit" First year	**385450**
Second and third year	**405450**
Initial Capital required	**417150**

Home consumption

	Quantity Kgs	Tgs/Kgs	Tgs
Potatoes	240	100	24000
Cabbage	120	120	14400
Turnip	60	130	7800
Bulb Onion	20	250	5000
			51200

Home consumption would reduce cash available from the profit figures by 51200 Tgs.

RECOMMENDATIONS. SECTION 2

Deals with the new seed multiplication unit which are to be established and existing units in need of strengthening. They are commercial units with an existing management structure and support for these units is recommended to provide good quality seed for the small units, supporting the units set out below will create 14 regular and 41 casual jobs.

1. AN INDICATIVE BUDGET FOR TUNGALUG TAMIR(No interest charges) '000 Output 200 t. Seed potatoes 30000..

Capital costs Fencing	2000 .	
Tractor	4400.	
Complete harvester	2000.	
Total written of over 3 years		2800.
Working costs		
First year seed 50 t. at $600		13800.
Subsequent year seed 50 t. at 150 tgs.		7500.
Fertilizer 8 t. at 110,000 tgs/T		880
Labour	10 casuals at 75 tgs/yr.	
	4 regular at 240 tgs/yr	1710
Machinery and fuel		3400
Electricity and heating		400
Transport and misc		1000
Annual costs First year		23990
Subsequent years		17690
Annual cash surplus First year		6010
Subsequent years		12310

2.1. Ikh Tamir. Establish a potato variety testing and seed multiplication unit at the High Mountain Research Station(HMRS) !5 ha. a year using N.W.European or Chinese varieties chosen for 90 day
yield and Phytophera resistance.

Establish a fruit bush propagation unit at the HMRS for *Ribes and Vaccinium spp.* using NW European
varieties.
Inputs
Potato Seed 40 tons
Fruit Bushes 500 bushes Machinery Planter, cultivator, ridging bodies, elevator digger.
Fencing Repairs to store Working capital for fertilizer,fuel, machinery spares and labour.
2. 2. Tuvshruleh Establish a seed multiplication unit for the seeds not readily available in Mongolia on 3 ha. fanned by the Ondral Co. 2ha.of onion sets , 0.1 ha.Chinese cabbage, 0.1 ha. beetroot, 0.3 ha. green beans.
Inputs Onion seed 50 kg.supplied over 2 years.
Beetroot seed 4 kg.
Chinese cabbage 4 kg.
Bean seed 25 kg.
Construction of store
Working capital for machinery and labour. Labour charges will be considerable.
2.3 . Tungalug Tamir. Mr. GUILIA'S unit.
By far the best large scale vegetable unit seen in Arkhangay and the main supplier of vegetables to the Aimag centre.Funds to be made available to maintain the present level of production (the youngest tractor is 12 years old) Establish a 20ha. potato seed growing unit to be added to the existing 40ha.grown for consumption and using similar varieties to the IkhTamir unit. A complete harvester (potato combine) will be needed to handle this additional area. Sufficient storage capacity already exists on the site Inputs Potato seed 50 tons Machinery Potato combine.
Tractor Working capital.Fertilizer, fuel and machinery and labour.
2.4. Bulgan. Strengthen the 20ha.existing seed unit run by the Bayandor Co. The existing seed has not been renewed for 8 years and should be replaced by Russian certified seed of seed of good quality and a loan made for store repairs.
Inputs
Potato seed 50tons.
Repairs to store.
2.5. Tsenker
The green house unit run by the Bayanburt Co. has two houses completed except for the polythene covering which they cannot afford to cover, this would increase the capacity of the unit by 50%.
Repairing the heating in the existing unit.
Inputs
Polythene sheeting 660 sq. metre.
Repairs to heating pipes.
New tomato and cucumber seed (not hybrids)

2.6. Hotont.
Establish a commercial potato unit to be attached to the existing arable unit run by the Hangburgaltai Co. already growing 1200 ha. of wheat.
Inputs.
Potato seed 50 tons
Machinery Planter and elevator digger.
Working capital for fertilizer, fuel, machinery spares and labour.

END OF PROJECT SITUATION 5 YEARS HENCE.

Additional production

Units	Potatoes / tons	Vegetables / tons
5000 Family units	1400	1400
200 O.Sha. commercial	500	700

3 Large	5 5 ha.	660	-
Total		**2560**	**2100**

These figures ignore any increase in crop yield on the present area from improved varieties and techniques. 1994 yields were 1000 tons of potatoes and 200 tons of vegetables. There would be 214

regular and 240 casual jobs created for a total expenditure of $600000 if all the above plans were implemented.

INTERNATIONAL SUPPORT

The appointment of a UNV or VSO. for a period of 4 years is strongly recommended. The role would be

1 Advising the seed multiplication units at Ikh Tamir, Tungalug Tamir and Tuvshruuleh.
2 Advising and assisting the Aimag Coordinator.

The UNV/VSO would have experience in agriculture/horticulture and knowledge of

1 Seed potato multiplication
2 Fruit bush propagation.
3 Onion set production.
4 Vegetable seed production.
5 Conducting simple variety trials.

Transport would be needed and some interpreting assistance.

PILOT PROJECT

A Pilot project should be instituted to provide continuity between the FAO and IFAD. project, details are set out below with an estimate of costs in USD. It should

1. Provide advisory materials for immediate use in the Aimag. Instruction booklet, slides, projector

500 copies of book	650	
Authors fees	350	
Projector and slides	1000	
Total.		2000

2. This winter run a 5 day training course in the Aimag centre for potential Sum advisors, a refresher course in vegetable growing and one on effective communications. To be given by two lecturers from the Agricultural University.

Two lecturers fees and expenses	200	
Nineteen Sum advisors expenses	470	
Room hire	30	
Total		700

3. Purchase of polythene and assorted vegetable seeds for two sites at Ikh Tarnir (Mr. Batulga) and Tungalug Tamir (Mr. Guulia). This will identify the correct varieties to be ordered when the main Project begins

Imported small seeds	200	
Polythene 1000 sq. metre	260	
Total		460

4. Purchase of seed potatoes for trials at Tungalug Tamir and Ikh Tamir.(HMRS), which will enable the correct varieties to be ordered in the future.

Dutch seed 800
Russian seed 300
Chinese seed 300 1400

5 Purchase of fruit bushes for Ikh Tamir (HMRS). A small number of bushes to be purchased to allow the work of propagation, which is a slow process, to begin.

300? Fruit bushes 600

6. Purchase of one push hoe and drill to test their usefulness in Arkhangay.

400

7. Five trips to Arkhangay by an agronomist from the Agricultural Universitywith knowledge of polythene ground covering technology and conducting variety trials. To give advice, demonstrate polythene soil covering and supervise vegetable trials. 700

Total Cost of Pilot Project 6260

Responsibilities.

1 Ordering Dutch potato seed, vegetable seeds, fruit bushes, tools and slides.

2. Ordering Chinese and Russian potato seed, polythene and projector.

Financing would be from FAO/UNDP through either the Mongolian Association of Soil Fertility or the MOFA.

Payment to suppliers would be through an ESCRO account.

Table 1 Area of potatoes and vegetables planted in Arkhangay 1989 - 1995

	Potatoes ha.	Vegetables ha.
1989	415	138.3
1990	365	130.6
1991	302	57.4
1992	274	60
1993	307.6	88.8
1994	248	72.5
1995 provisional	194	75.8

Table 2 Average crop yields for Arkhangay in 1992 and 1994. tons / ha.

	Potatoes	Cabbage	Turnip	Carrot	Onion
1992	8.0	10	9.6	6.0	3.5
1994	6.9	8.4	5.0	4.1	3.1

Table 3 Heat units and temperatures in selected Sum.

Location		Heat sum >5C	Heat sum >10C	Mean air t. C June	Mean soil t June
Bulgan	1725.5	1634.9	1320.2	19.9	12.7
Chulut	1739.1	1626.4	1174.5	18.0	12.1
Hotont	2131.6	2046.8	1819.5	18.2	15.0
Ic Tamir	2036.6	1913.8	1642.4	22.6	13.8
Jargalant	1975.4	1870.1	1542.9	21.7	14.9
Ulzit	2268.7	2174.2	1937.2	23.0	16.3

Table 4 Dates and number of frost free days in selected Sum

	Last Spring Frost	First Frost	Autumn		Frost freedays
Location	Average date	Latest date	First date	Average date	Average days
Bulgan	1/6	22/6	1/8	10/8	70
Chulut	7/5	25/6	1/8	16/8	70
Hotont	19/5	31/5	5/9	10/9	114
Ic Tamir	27/5	25/6	19/8	3/9	99

Jargalant	1/6	14/6	26/8	4/9	95
Ulzit	22/5	15/6	26/8	5/9	106

Table 5 Rainfall data for selected Sum.

Location	Annual rainfall mm.	Oct-Apr rainfall mm.	May-Sep rainfall mm.
Bulgan	329.	27	302
Chulut	258	31	227
Hotont	243	27	217
Ic Tamir	363	20	343
Jargalant	387	42	345
Ulzit	298	11	286

Table 6 Distribution of potato machinery by Sum.

	Tractors	Ploughs	Planters	Elevator digger
IcTamir	20	1	1	1
Chulut	15	1		
Hangai	14	2		
Tariat	7	3		
Ondor Ulan	11	1		
Erdenmandel	13	1	1	1
Jargalant	8	0		
Tsetserleg	10	0		
Haihan	61	17	1	1
Batsengel	5	3		
Ulzit	14	10	1	1
Uginur	18	5	1	1
Haishat	18	13	1	1
Hotont	32	18	1	1
Tsenker	18	2	1	1
Bulgan	10	2	1	2
Tuvshruuleh	63	33	1	1
Tungalug Tamir	17	4	1	1
Totals	354	116	11	12

Table 7 Sum storage capacity (excluding small private stores), some are in need of repair.

	Stores	Capacity tons
IcTamir	3	300
Batsengel	2	200
Ulzit	2	40
Uginuur	1	20
Haishat	2	40
Hotont	5	310
Tsenker	5	500
Bulgan	5	550
Tuvshruuleh	4	240
Haihan	-	20
Tungalug Tamir	8	560
Aimag center	6	300
Total		3080

Table 8. Prices of available vegetables in Ulaanbaatar and Tsetzerleg early September 1995.

	Ulaanbaatar. tgs./kg.	Tsetzerleg. tgs/kg.
Potatoes	100	100.
Cabbage	165	n.a.
Turnip	150	130
Carrot	225	500 only one lot on offer.
Beetroot	300	400 " " " " "
Tomatoes	800	n.a.
Cucumber	400	400
Blackcurrants	1000	n.a.
Billberries	n.a.	700
Melon	400	400

ANNEX B.

THE AGRICULTURAL SUPPLY COMPANY

The Company will import fertilizers, seeds and machinery on receipt of a written order and cash. They have commercial contacts with 14 countries but trade mainly with Russia.

Fertilizer Potash and Superphosphate is available from Russia.

Seed Potato, cabbage, turnip, carrot and beetroot seeds are available but their is no technical expertise to check suitability or quality, payment is in USD.

MONPAC PLASTICS COMPANY

Has been established for a year using new Finnish machinery and Rusian prills which they find satisfactory, The range of products are

1. Thick 0.2mm. thick 1.6metre wide.
   !kg. is 5 metre long *ie.* 8 sq. metre.
   Daily production is 350kgs/day. Need one weeks notice for small orders and one month for orders in excess of one ton. For large orders they will vary width from l.Oto 1.6 metre.
2. Thin 0.04mm. thick 1.6 metres wide.
   1 kg. is 16sq. metre.

GRAZING MANAGEMENT

Mari a Fernandez-Gimenez

I. Obj ectives

This report has three purposes. First, it provides a brief summary of historical and current grazing management practices in the project area (Arkhangay Aimag), with special attention to recent changes that may have important environmental and social implications. Second, it reports the responses of herders to the proposed FAO/TCP project recommendations in the Grazing and Livestock Management section. (These responses are integrated into the relevant sections of the report, instead of being segregated into a separate section.) Finally, it raises for consideration key issues in the management of livestock and grazing resources in the project area that have not been adequately addressed elsewhere.

II. Overview of Grazing Practices in Arkhangay

1. During the pre-revolutionary period, large, diverse herds were moved over long distances to use a wide variety of pasture resources. Pasture use was regulated through a combination of

informal local institutions and formal law. Distances moved on the north slope of the Khangay Mountains were probably shorter than those of herders on the south slope, who commonly migrated all the way to the Gobi in the winter. During the collective period, large, specialized herds moved intermediate distances (20-40 km) between seasonal camps, facilitated by lorry transportation and regulated by collective administrators and livestock technicians. Currently, during the transition to a market economy, a large number of small and medium sized, diverse herds are moving short distances (average less than 5 km between seasonal pastures in the mountain steppe, somewhat farther in the steppe zone) using traditional ox-cart transportation. Pasture allocation is decided among herders themselves, with recourse to local officials when serious disputes arise.

2. Arkhangay herders traditionally moved their herds a minimum of four times a year among seasonal pastures, more often in periods of climatic stress. Seasonal pasture areas are selected for forage and physical attributes such as water quality and quantity, shelter from wind and cold (in winter and spring), absence of flies and mosquitoes {in summer), and
availability of mineral licks. Winter and spring pastures are usually not grazed during the summer and fall in order to save the forage for use during winter and spring.
In the mountain-steppe and steppe, winter and spring pastures and shelters are usually located on protected mountain slopes or uplands, summer pastures near rivers or wells, and autumn pastures in good fattening areas near salt licks. In recent years, perhaps due to a shortage of upland campsites, herders have begun to locate winter and spring shelters along rivers in willow thickets. Some experienced herders believe this is a mistake. In their view, the cold temperatures and damp soil near the river cause spontaneous abortions and contribute to disease. Based on our interviews, there appears to be some evidence (high incidence of abortions and low lamb survival) to support this view.

3. Within seasonal pasture areas, herders usually alternate grazing areas, so that one household's herd seldom grazes many days sequentially in the same area. Some herders consciously rotate grazing areas in this way, but the choice is more commonly left up to the livestock. The resources within a
seasonal pasture area are classified by herders by their suitability for different types of livestock and their appropriateness for use in different types of weather conditions. The major distinction in the mountain steppe is that between "thin grass," high-quality forage for sheep and goats, and "thick grass" most suitable for cattle and horses. In high mountain areas, where one household or knot ail may lack access to both thin- and thick-grass pastures, it is becoming common for households to exchange herds to place herds with a relative who has access the to needed pasture resource. (For example a household who lacks access to good thin-grass pasture places their sheep and goats with a brother whose seasonal pasture includes thin grass.)

4. Small stock are herded closely during all times of year, and brought back to the camp nightly. Cattle and horses usually roam more freely, although cattle may be herded throughout the day during certain times of year, and horses
are generally kept closer to camp during the summer, when rnares are milked.

5. In addition to regular seasonal moves of the entire camp, longer-distance moves of a portion of the camp and herd (called "otor") are common. Otor is done in winter to escape the effects of serious storms that render grass inaccessible, in spring to seek the first green vegetation and help animals recover from the winter, and in summer and autumn to fatten animals and provide them with essential minerals. Late summer and autumn otor are very common in Arkhangay. The history of the practice of otor is unclear, but we suspect that it was a traditional practice that was coopted and encouraged during the socialist period as a means to promote efficient pasture use (i.e. use of remote pastures), while maintaining control over the pastoral population, since the main

household stayed settled in a more accessible location. In Arkhangay it appears that otor is increasingly used to compensate for the apparent sedentarization of herders. For example, in Ulziit Som, a household that camps in virtually the same camp year-round sent their 260 sheep and goats and 10 horses to otor pasture 30 km distant for one month to fatten in late August.

6. During the collective period most sums set aside areas of pasture specifically for use during climatic emergencies, particularly winter storms. In most cases this official designation and protection is no longer in effect (Under-Uulan Sum is an exception). In addition, many herders plan the use of their winter and spring pastures so as to reserve forage in protected areas for use in bad weather.

7. Herders and officials widely acknowledge the reduction in mobility and concentration of households along roads, near sum and bag centers and near water sources (especially large rivers during the summer). The explanation for this settlement pattern is invariably herders' desire for access to sum and bag center services, especially schools, medical facilities, and markets. In some cases herders also hook into local power lines for electricity. Lack of access to transportation is a second major constraint to mobility according to herders. When sedentary herders near the som center were asked if they would move if transportation were not a constraint, they said "of course." Some researchers also perceive a shift in herders' values and livestock production goals as an important factor in sedentarization. In the past, herders' primary goal was increasing herd size. Meticulous care of animals was an end in itself and livestock were valued almost as highly as children. Today, as herders become more interested in accumulating other forms of wealth, particularly consumer goods, livestock are increasingly seen as a means to an end. If such a shift in values and production objectives is occurring, then improved access to services and transportation in remote areas may be ineffective as incentives to increase mobility.

There is an increasing trend to build permanent residential structures (cabins and wooden gers) in summer and autumn pastures as well as winter and spring campsites. The rationale provided for this behavior was two-fold. First, ger coverings rot quickly in the wet mountain-steppe summers and it is more cost efficient to build a wooden cabin for 50,000 tg that will last for many years than to purchase a plastic tarpaulin (to cover a ger) for 30,000 tg that will last only 3 years. Second, the construction of a building is a means of establishing a claim to surrounding pasture. The consequence of this building activity is that herders return to the exact same locations annually, rather than alternating pastures depending on the location of the best forage in a given year. Households also tend to occupy "improved" sites for a longer time, sometimes camping there year-round.

III. Rights to Pasture Resources

Winter and Spring Shelters

1. Many herders have been using their current winter and spring shelters for less than ten years. In few cases were winter or spring camp locations traditional use areas inherited through several generations. (One researcher at HMRS estimated that fewer than ten percent of herding households camp at traditional, inherited winter and spring camps.) Many herders purchased the improvements at their camps with privatization vouchers, in most, but not all cases, the with berries, some with no berries, some with marmots, some with no marmots." When we suggested that leases would apply only to forage and not to the other resources that might be found on a specific allotment, herders found the fragmentation of "land" into a composite of different resources (to which different rights might adhere) difficult to comprehend. "That is not the way Mongols think," was the reply. "People will think that if this is my pasture, these are my trees, water, berries and so on." Thus, while some herders appreciate the rationale for more secure and exclusive tenure to pastures, they are also afraid of being excluded from other traditionally common resources such as water, forests, fruit and

game. Although the land law clearly maintains water, for example, as a common resource, local perceptions of ownership may cause problems in the implementation of the law.
We asked herders what entities would be the appropriate lease-holders for pasture under the new law and what size area should be encompassed by a lease. Herders were evenly split between those who thought that leases should be made at the level of the bag with herders free to nomadize within the bag boundaries and organizing pasture use among themselves with the authority of the bag governor, and those who thought leases should be made to khot ails. One individual thought that leases should not be smaller than the area of the entire sum. (In other parts of Mongolia discussions are going on about the possibility of merging current sums back into territories approximating the pre-revolutionary khoshoos in order to allow herders access to a wider range of pasture resources and ecological zones, and facilitate traditional-style long migrations. Rumor has it that sums in Zabkhan and Hentii aimags have agreed on such reunions.}

We also asked herders how they would organize responsibility for maintaining or improving the condition of leased land, particularly if land were leased in common to the whole bag. This was a difficult concept for most herders, who resorted to the authority of the bag leader to decide these matters. One interviewee insisted that herders would be able to regulate among themselves, even when it means imposing sanctions on violators.

IV. Perceptions of Pasture Condition

Most herders and all officials recognize that some areas in their sum or bag territories exhibit signs of over or improper use. Herders interviewed in Arkhangai referred to these areas as weedy or waste lands ("khog gazar"), degraded ("muudsan") pasture, bald or black pasture ("khadzgay" or "khar belchir"), or places where the "soil has died" ("khurs ukhsen"). Among herders the most widely recognized indicators of these changes are an increase in weedy, unpalatable species, especially *Artemisia glauca* (in the mountain-steppe) and Artemisia *adamsii* (in the steppe), and overall reductions in the amount of vegetation cover and the height of plants.

However, some plants commonly viewed by ecologists as potentially undesirable disturbance-related species, are considered useful by herders. These include *Chenopodium album* (LambTs quarters), *Plantago* sp. (Plantain species) and *Urtica sp.* (Stinging nettles), all of which occur at sites of very high livestock and human activities, like the areaз immediately surrounding winter shelters, heavily used waterways and wells. *Artemisia frJ.gJ.da* (Fringed sage) , which increases with moderate grazing pressure, is one of the most valued forage species in the steppe and mountain-steppe. On the other hand, ungrazed high mountain pastures are perceived as poor forage by herders since the heavy thatch of litter limits growth to coarse, tall grasses undesirable to herders. The differences between herder and "scientific" definitions of useful and desirable vegetation should be taken into account when developing monitoring programs and pasture management criteria. In particular, criteria based solely on the apparent "serai state" might lead to conflicts between herders and regulators, since pastures in a somewhat lower serai state may be more desirable to herders than "pristine" pastures. (The use of serai stage as a criteria for measuring pasture condition has also been strongly criticized on ecological grounds.)

Herders perceived that heavily used areas were located near sum and bag centers, along roads and trekking routes, rivers, and at campsites (especially winter and spring shelters) that were used for many years. (In Under-Uulan Sum two khot ails with 23 and 25 households were reported. Each of these khot ails wintered over 5000 livestock at one winter shelter and the impacts were reported to be severe.) Herders vary in their perceptions of how quickly and/or completely these heavily-used areas recover to healthy pasture. Estimates ranged from 2 years if no households camp there and the rains are good to no complete recovery to high-quality pasture within a herder's lifetime. Some herders also referred to their summer pastures at the end of the season as being "degraded" but this change was seen as a temporary one, reversible in the next year if rains are good. Abandoned

cropland (now weed-infested) and areas of rodent activity were also mentioned as "degraded" land. (The rodent activity we observed on this brief survey was minimal, but may be more prevalent in other parts of the Arkhangay steppe.)

Older herders did not perceive long-term declines in overall productivity of pastures in the mountain-steppe. Temporary declines were attributed to poor rainfall. One herder expressed her belief that the inherent productivity of the land has not declined by saying, "The roots have not diminished. If plants grow less it must be because of the rain." In general the last three years were perceived as having good rainfalls and pasture growth. Research at the HMRS supports herders perceptions, showing that productivity of important forage species in the mountain-steppe can vary by 75% depending on rainfall.
Many herders, especially those in the mountain-steppe, reported underused areas in their territories. These areas are almost always distant from centers and services and sometimes (but not always) lack water. In some cases, these pastures were occupied during the collective but have been effectively abandoned since then as transportation and access to services became major determinants of herders' pasture use and mobility.

Herder responses were mixed when asked about incentives to use more distant pastures. Clearly the best incentive would be to find means of providing the facilities and services that herders desire in remote areas. (If good communication and transportation were available, services such as medical facilities could still be centralized, while giving herders the assurance that they could call for help and reach a doctor or have a doctor reach them—within a reasonable amount of time.) Better access to transportation for nomadic moves would also contribute to better distribution of herds. The potential effectiveness of differential grazing fees for use of remote areas is uncertain. Some herders said that lower fees might persuade them to use more distant areas, while others said they didn't know or probably not. The cost of the fees and the steepness of the differential will be important factors in the effectiveness of this method. When herders were asked what pastures they would use if they could use any pastures in their territory without the constraint of transportation, they often said they would prefer to stay where they were, even if the area appeared overused to the observer.
Herders and local officials have definite concepts of the number of livestock that can be sustained by a given area of land. Ulziit and Battsengel sum governors estimated that their current sum herds were 72 and 80 percent of the sum territory carrying capacity respectively. Herders, when asked if their current seasonal pasture area would support their ideal-sized herd, frequently answered that it would not. If their herd grew successfully they would need to find additional pasture or sell or consume the excess livestock. (Most insisted that they would find a way to acquire the additional pasture needed.)

Carrying capacity is mentioned here not because it is a useful concept for managing common property rangelands in the main it is not. Rather it is important to point out that, contrary to some reports, Mongolian herders and officials usually have a well-developed knowledge and awareness of the herd sizes their pasture can support. There is a widely used and understood Mongolian term for carrying capacity ("belchirin daats") and herders perceive that rainfall, over-and under-grazing all affect pasture production. When asked their ideal herd size and composition, herders often take into account resource as well as labor limitations.

V. Key Issues in Future Livestock and Grazing Management

Many people doubt the feasibility of maintaining healthy pasture conditions while simultaneously improving the productivity of livestock and herders' standard of living. To achieve this objective, a number of options must be explored, not all of them directly related to livestock production. The FAO/IFAD projects address this challenge by seeking to improve herd productivity, add value to

ivestock products, and develop alternative sources of income for rural inhabitants. We suggest that additional actions are needed, in the short and long terms, to ensure high livestock productivity and protect the ecological quality of pastures. In the near-term, the development of ecological monitoring procedures and institutions is essential to maintaining pasture health and ensuring successful implementation of restocking and land leasing programs. In the longer term, strategies for more opportunistic use of pastures and close tracking by livestock populations of forage resources should be explored, as well as incentives for herders to improve productivity by altering herd structures and increasing individual animal productivity, rather than increasing livestock numbers.

1. Monitoring and Management of Pasture Condition Under Land Leasing and Restocking

The lajid law sets out basic ecological criteria for monitoring the quality of pasture land and mandates that lease-holders be responsible for maintaining or improving the condition of leased pasture. However, no specific local monitoring criteria have been produced, no practical procedures for monitoring and enforcement have been developed, and little or no baseline data on local pasture conditions exist. (Large-scale land classification has been done, and will presumably form the basis for setting lease rates according to the quality of pasture.) In view of the concern about the ecological impacts of re-stocking and the proposed involvement of the FAO/IFAD projects in rapid implementation of pasture and hay leases in Arkhangay, we recommend that the projects support the timely development of a pilot ecological monitoring program to accompany the re-stocking and land lease components.

It is critical that the development of scientific and institutional procedures for ecological monitoring and management be developed in tandem with the institutions for leasing and re-stocking. To leave monitoring to an afterthought is at best irresponsible and at worst could undermine the success of the entire restocking program, which will be vulnerable to attacks by environmental critics. The best defense against such critics, and the most useful ecological feedback on restocking and leasing impacts, will be produced by a rigorous, flexible, locally-adapted monitoring program. To this end, a few test monitoring points should be established as soon as possible and baseline data collected. FAO/IFAD should work with Mongolian scientists, Arkhangay officials and herders to develop ecologically meaningful local criteria (within the parameters set out in the land law), test monitoring methods and build local institutional frameworks for ecological monitoring and enforcement of leases. The development of such institutions should be carefully coordinated with the development of institutions to handle land-leasing.

2. Increasing Livestock Productivity in Arkhangay: Trade-offs and Incentives

There are (at least) three potential means of increasing the productivity of livestock production in Arkhangay: increase livestock reproductive rates and reduce mortality; increase individual animal productivity; and increase the value of livestock products. The current projects address the first method by proposing to improve veterinary services, improve forage availability by supplying secure pasture and hay tenure, and reduce risk for herders. The second is addressed through proposals to develop breeding programs for nigh-productivity local stock (elite herds).

VI. People Met and Consulted

Officials

Mr. Olirbii, Under-Uulan Sum Governor
Mr. Munkhu, Bichigt-Khangay Company, Assistant Director,Under-Uulan Sum, Hano Bag
Mr. Damdinjab, Ulziit Sum Governor
Mr. Gantumur, Battsengel Sum Governor
Mr. Jigjidsuren, Director of Civil Defense, Arkhangay Aimag
Ms. Purevdolam, Researcher, Meteorological Research Station, Tsetserleg

Mr. Sovar, Zootechnician, Agricultural Exchange, Tsetserleg
Mr. Batulziit, Bag Leader, Ikh Tamir Sum, Sixth Brigade

Herders
Mr. Delgersaikhan, UL Sum, Bodond Bag
Ms. Jagsal, UL Sum, Bodond Bag
Ms. Jijid, BT Sum
Ms. Bodirjansan, BT Sum
Ms. Nyamgarav, BT Sum, Daaga Bag
Mr. Byambasuren, BT Sum, Daaga Bag
Male herder, IT Sum
Mr. Ganjin, IT Sum, 6th Bag
Mr. Shaarii, IT Sum, 6th Bag
Female herder, BT Sum
Ms. Balmaa, BT Sum
Ms. Doljinsuren, IT Sum, 6th Bag

RISK MANAGEMENT

Mari a Fernandez-Gi menez

I. Introduction

Extensi ve pastoral 1ivestock production is an inherently risky enterprise. Both livestock and human populations are vulnerable to the harsh climate, fluctuating primary productivity and periodic extreme climatic events that characterize the arid and semi-arid ecosystems where most extensive pastoralism takes place. Mongolia is typical in these respects, and probably has a more extreme climate than many regions where extensive pastoralism is an important economic activity. In addition, the nomadic herding strategy traditionally used by Mongol herders and which mitigates important climatic risks and promotes efficient use of pasture resources, may increase herders' vulnerability to other risks, particularly those that di rectly affect human health and safety.

It is widely recogni zed that during the collective peri od the state bore the burden of risk for livestock production and human health and welfare, protecting herders through mechanisms such as provision of supplementary fodder, livestock insurance, veterinary and social services. With the dissolution of negdels, the resumpti on of pri vate 1i vestock husbandry and the decay of social, medical and veterinary services, the burden of risk for livestock and human welfare has largely been transferred back to herders, with the nexus of responsi bi1i ty bei ng the household. Whi1e many "traditional" herding practi ces and social institutions appear to be reemerging to cope with this shift, there are also growi ng tensi ons and trade-offs between the management of risks that threaten livestock production and those that affect people directly. Clearly the welfare of herders is inextricably li nked to the welfare of their herds (and vice versa). However, whereas once livestock health and productivity corresponded virtually completely with human health and welfare, today strategies such as mobility that were the basis for successful livestock production under fluctuating environmental conditions are increasingly in conflict with herders' need and desire for access to health and social services and markets.

This report exami nes 1ocal percepti ons of risk to livestock production, current and potenti al future strategies for managing risk, and the potential costs trade-offs involved. The 1994-1995 dzud in Arkhangay Aimag provides the opportunity for a case study of the (1993) classify Arkhangay as a medium-risk aimag with respect to dzud, with an average of at least one large dzud every 7-14 years.

In 1994, the first snows fell in late September and by late October, following two successive storms, snow up to 42 cm deep had accumulated in some areas. Many herders were still at their autumn camps and some were at distant fattening pastures, caught unprepared and without adequate shelter for their livestock. By the end of December a total of 70 cm of snow had fallen in Ulziit Sum. Roads were completely impassible in many areas, and in some places remained closed until spring. The snow did not melt in January or February and additional fresh snow fell throughout March.

Eight sums were affected by the dzud, three severely. Battsengel Sum was covered with deep snow over 100% of its area, Ulziit over 80% and Under-Uulan 60%. National and aimag officials who visited the sums in December during the year-end livestock census recognized the severity of the disaster immediately and requested assistance from the State Emergency Commi ssion (Ulcin Ontsgoy Komis), which provided approximately 5 million Tugrics in cash funds to the three most severely affected sums, the aimag center in Tsetserleg, Ikh Tami r and Ulgii-Nuur Sums. Funds arri ved in January and were distributed directly to the sums. Sums used the funds to purchase and distribute feed to herders, about 80% of the expenses accounted for by transportation costs. In addition to the funds provided by the national government, aimag and local governments, companies, private organizations, and one national NGO provi ded various types of assistance (see table 1).

According to the Office of Civil Defence in Tsetserleg a total of 1390 tons of hay, 400 tons of green fodder, 100 tons of chaff and 200 tons of minerals were distributed.
This falls far short of the estimated need of hay, 6626 ton of chaff and 3059 tons of Most of the fodder was purchased from Bulgan and Tuvshuul Sums, from the remaining Aimag Fodder Fund, and from Bulgan Aimag.sold to herders on credit at a large di scount. At least one sum (Ulziit), distributed 350 grams of hay for each sheep unit of livestock free of cost. Several herders complained that the quality of the distributed fodder, especially baled hay from the compani es in Bulgan and Tuvshuuril Sums, was mouldy and of poor quality. In some instances, herders who had no supplemental fodder reported feeding flour to their sheep to keep them alive. Some herders with shortfalls in hay were able to borrow small amounts of hay from neighbors or relati ves.

Table 1. Assistance provided in 1994-1995 dzud in Arkhangay

Origin Assistance	Organization	Type/value of ('000 tg)
national	State Emergency Commission	5,000
national	Mongolian Red Cross	500, food, clothing
national	Mongolian army	200, supplies
aimag	aimag veterinary hospital	3 tons chaff
aimag	Mongol Daatgal (Insurance) Company	100 packages radio batteries
aimag	Bayan-Uul Company	12
aimag	Gurvan Tarni r Co.	20
aimag	Agricultural Coop.	125
sum	Undur-Uulan sum gov.	500
sum	Battsengel sum gov.	1 ,000

According to sum estimates, approximately 148,980 head of 1ivestock were trekked to 1ess snowy areas within the three most heavi1 y affected sums. (Aimag officials estimate that 75,000 livestock were moved to areas 30-70 km distant.) Most households used their own transportation, horses and ox-carts, to trek animals and transport belongings to "otor" pastures. In some cases vehicles from the sum or aimag center broke trails for livestock to follow, but in most instances herders had to break the trail themselves on foot or horseback. Only Under-Uulan Sum, of the three most heavily

affected sums, had officially reserved emergency forage areas. (During the col1ective period most sums designated official emergency reserve areas, but this practice ceased with privatization in almost all sums. However, there are usually underused pasture areas that serve as de facto reserves and to which herders move in times of disaster.

Total livestock losses based on sum government estimates ranged from 8.5% of the total herd at year-end 1994 in Under-Uulan Sum to 20% in Battsengel Sum (Table 2). Ulziit Sum suffered losses of 9% of the 1994 herd, but the combined losses of 1994-1995 and the 1992-1993 winter and spring storms amount to 26% of the total 1993 herd.

Table 2. Total livestock losses in the 1994-1995 dzud

Sum	livestock total, Dec. 1994*	total deaths in dzud**	deaths adults	% Loss newborn
Undur-Uulan	93,162	8,000	4,889	3,111*
Ulziit	64,857	5,884	3,284**	2,600**
Batsengel	121,277	25,000	10,644	14,356*

Note; * aimag government estimate; ** sum government

A large proportion of losses (44-57%) were newborn and baby animals. As much as 75% of adult losses were yearling animals. Cattle and sheep suffered the greatest losses as percentages of pre-dzud herd sizes. The lamb crop, which suffered the most severe losses of all 1995 offspring, had only a 52% survi val rate in Battsengel Sum (85% and 86% in Under-Uulan and Ulziit Sums respectively) (Table 3). Based on conservati ve esti mates of 1995 local prices for livestock in Chuluut Sum, Arkhanghay, losses of adult animals as of April 1995 in the three most severely affected sums are valued at 150,549,000 Tugrics (about US$334,000). (This figure does not include the loss due to the deaths of newborn and young animals which accounted for 44-57% of all deaths.)

Table 3. Survival of 1995 offspring

Sum	survival of 1955 newborns to July 1995 (%)	
	all speci es	1ambs
Undur-Uulan	89	85
Ulziit	87	86
Batsengel	60	52

Source: aimag statistics

Case histories of herder responses to dzud

The first three cases are from Ulziit sum, Bodond bag. In Ulziit, herders suffered two major disasters in rapid succession. In the spring of 1993, following a hard winter, a freezing rain storm struck in early May. The combined losses of an October blizzard and the spring storm were 13,525 head of livestock: 18% of the sum's total herd. Then in the winter of 1994-1995 an additional 5884 animals died. The total losses of the two dzud years combined amount to 26% of the total herd at the beginning of 1993.

(1) A widower with 7 children, B. left the sum center for the countryside in 1992 with the 5 cattle, 4 horses, 20 sheep and 10 goats the household received in privatization. In the 1992-1993 blizzard and spring storm he was unable to move his livestock and lost all of the small stock and one horse. These losses occurred despite receiving 1 cattle-cart, 100 kg and 5 25kg bales of hay from the bri gade center. He also received tea and flour at half price. In the 1994-1995 blizzard, B. lost an additional horse. His family had cut 5-6 cart-loads of hay (about 1 ton). In addition he bought 5 bales from the bag center at the cost of one 1amb. His family received free children's clothing for three children (from the Mongolian Red Cross). Since he has lost nearly all his livestock (he now has only 3 cattle and 2 horses), he used his pension money (5,492 Tugrics per month) to buy a cow for his family to eat for 25,000 Tugrics.

(2) M.'s household of nine currently owns 15 cattle, 10 horses and 260 small stock. The household had large losses in 1992-1993, but minimal losses in 1994-1995. In 1992-1993 they lost 44 cattle, 10 horses and over 50 sheep. It was very cold but not too snowy. They had only a small supply of hay and purchased 10 bales of hay and some chaff from the sum center. They were unabl3 to move due to a sick grandmother and said that there was no place to move to in any case. In 1994-1995 they cut 5-6 tons of hay, bought 10 bales and recei ved 300 grams of hay per sheep unit in government assistance. They also purchased one 50kg sack of feed for 2000 tg. Currently they have adequate livestock for subsistence needs but no cash. They have not received their pensions in 3 months and were unable to pay their livestock tax. This household is also almost completely sedentary, moving only 200 meters between their winter shelter and other season camp. Nonetheless they claim to reserve pasture for winter/spring use.

(3) R.'s household of eight currently owns 27 cattle, 24 horses, 100 sheep and 60 goats. They suffered relatively small losses in 1992-1993 (7 cattle and 3 horses) and 1994-1995 (2 cattle and 2 horses). At the time of the 1994 autumn blizzard they were still at their autumn pasture. They first moved their livestock 5 km to their winter shelter and later 13 km over the mountain for 1 month. They own their own truck, which greatly facilitates moving. In 1994 they cut 8 cart-loads of hay (and in 1995 10) and purchased 5 bales of hay in exchange for 1 lamb. They also received 1 kg of free butter in assistance. They reported of hearing about additional assistance but it never arrived, about which they said, "usually sum center people get it, not the herders." Although their losses were relatively small, a neighbor who was unable to move lost 78 sheep and had a zero lamb crop.

(4) In Battsengel sum, B.'s household of 7 is very well- off. They own a truck and had a herd of nearly 2000 sheep before the dzuud last winter. They prepared 3 lorry loads of hay (about 6 tons) in 1994 and purchased an additional 40 bales of hay and 3 sacks of chaff from the sum during the dzuud. During the snow they took all the large stock on otor, using a path made by vehicles. The smal1 stock was 1 eft behind. In the dzuud they lost 1200 sheep, 33 cattle (including 18 yearlings) and 20 horses. Despite these dramatic losses the household is still well-off with 60 cattle, 80 horses, 400 sheep and 30 goats. The head of the household, who was quite old, died last winter. It is unclear whether his death was directly related to the disaster, or simply the result of old age. His surviving wife (age 70) is extremely active and able for her age, and appears well cared-for by her older children who still live at home.

(4) O.'s husband is in pri son and she lives with her 5 children as a single ger (not part of a khot ail) year-round. Her winter shelter is near the river, in a willow thi cket. (Usually winter shelters are located on protected mountain slopes. The currently increasing practice of wintering in the bushes by the river is vi ewed by some experi enced herders as a mi stake: they believe the soil moisture and cold temperatures cause spontaneous abortions and increased disease in livestock.) Because her husband was away, she was unable to move her livestock when the blizzard struck. The household lost 61 of their 96 sheep and only 10 lambs survived from the remaining 30 female sheep. About six ewes aborted. Her in-laws gave the household a smal 1 amount of hay. Apart from thi s, they recei ved no assi stance.

(5) In Under-Uulan Sum, 5th Bag, S.'s household of eight received 3 cattle, 3 horses and about 10 sheep and goats in privatization. Prior to the blizzard they had 10 cattie, 13 horses, 9 sheep and 7 goats. They 1ost 7 yearling and 2-year-old cattle, 3 horses and 9 small stock in the blizzard. They were forced to sell a cow to purchase flour and needed goods and killed the most of the remaining sheep and goats to eat. This left" them

Report of PRA Workshop on Poverty Alleviation
Chuluut *Sum,* Arkhangai aimag, Mongolia
28th-30th August 1995

Rosamund Ebdon
and Staff of CSD/SCF
Centre for Social Development
IAMD, Ulaanbaatar
Mongolia

CONTENTS

Glossary

aimag	province/district
sum	sub-district (rural town)
bag	lowest adminstrative unit (rural)
khot ail	small collection of herding households

1. Introduction

The report details in brief the results of a 2 1/2 day workshop on PRA and Poverty Alleviation in Chuluut *sum,* Arkhaugai The workshop completed an 8-day mission for the FAO TCP, exploring local perceptions of poverty. The main results of the mission are found in a separate report on 'Poverty Perceptions Among Rural Herders and *Sum* Inhabitants of Chuluut Sum'. This was the first sum-level PRA training run by CSD and so was very experimental in nature. The training team was made-up of 7 CSD/SCF staff and an FAO headquarters officer, Stephan Baas. The workshop focused on issues of local poverty and introduced PRA techniques as a means to identifying causes and potential solutions. Twenty participants attended, with representatives from the *sum* government, *bag* governors, herders and *sum* centre poor. A list of participants is included in

appendix 2. The workshop was extremely participatory and enjoyable, and discussions were open and animated - sometimes rather intense - providing a good forum for the sharing of differing opinions and ideas. The feedback and evaluations from participants were very positive and the overall feeling of the trainers was one of great success. However, the short time available (restricted by the schedule of the FAO consultant) and hence necessary intensity of the work, was felt to be somewhat of a constraint.

1.1 Workshop Objectives

The objectives of the workshop were as follows:
- to introduce PRA techniques
- to collect and analyse information on poverty in Chuluut *sum*
- to provide a discussion forum for the exchange of ideas between *sum* officials, *bag* governors, representatives of herders and *sum* centre poor, and outsiders,

1.2 Workshop Method and Agenda

The training approach was very relaxed and informal - tables were not used, only chairs arranged in a semi-circle - and many of the PRA activities were done on the floor or outside. This relaxed 'learning by doing' method is very new in Mongolia and thus the team were somewhat apprehensive about the response of participants, particularly because of the diverse mix (government officials, *bag* leaders, herders and representatives of the poor). However, their level of participation, attendance throughout the 2 1/2 days, feedback and written evaluations (see 2.9) are all testament to the effectiveness and appropriateness of the approach at this level and the possibilities for its wider use as a training method. The overall logic of the workshop was to begin with tools for general analysis (e.g., mapping) and gradually move to more focused methods of analysis (e.g., matrix scoring and seasonal calendars), looking at particular subjects related to poverty, and finishing with a simple planning method.

Due to unforeseen problems with generators and equipment, and the late arrival of participants, the workshop got off to a late start on Monday morning, but fortunately this did not disrupt the planned agenda significantly (appendix 1). The initial session was a brief introduction to participation and PRA and its context in Mongolia. This was followed by a Poverty Analysis exercise to establish the local situation and stimulate participation from the outset. The remainder of the workshop focused on introducing PRA techniques through small group exercises and these were interspersed with a number of games and activities. The PRA techniques were carefully selected as those considered to be most useful and appropriate for the different roles and responsibilities of the participants. The techniques introduced were: serai-structured interviewing, mapping, matrix scoring, seasonal calendars and daily routine on gender. Due to the high interest and very active discussions which followed the exercises on mapping and matrix scoring, there was insufficient time to do exercises on the latter two techniques, and so these were merely presented and discussed. If a full third day of training had been possible, these could also have been covered in more detail

The final half day introduced the SWOT analysis and planning methodology (Strengths, Weaknesses, Opportunities and Threats), as a way of bringbg the focus from general analysis, e.g., using mapping and other techniques, to the more specific, Le., planning. The final summary session invited feedback from the participants on the different techniques learnt and a written evaluation on the workshop as a whole (see 2.9).

2. Analysis of Sessions

2.1 Introduction to **PRA** and **Poverty** Analysis
The initial session was an introduction to participation and PRA, covering the history, main features, principles and methods, and the use of PRA in Mongolia to date, i.e., by the PALD research team and CSD.

The first activity was a poverty analysis exercise, where participants were divided into two groups to analyse the causes of poverty using a cause-and-effect chain of symptoms, primary causes and secondary causes. Each person was asked to write (in one or two words) on separate pieces of paper (post-its) what they thought the mam symptoms of poverty were, Le., they were asked "How do you recognise poverty in your area?". A poster was prepared with 'poverty' written in a circle in the middle of the page. Around this was drawn another larger circle representing the symptoms of poverty. Participants placed their papers within this and another circle was drawn around these. They were then asked to identify the causes of these symptoms and their papers were placed within the next outer circle. Finally, they were asked to identity what they believed to be the root causes related to these, and hence, the root causes of the symptoms identified. In this way they were able to analyse the main causes of poverty in Chuluut. A summary of their analyses is given below:

Summary of causes of poverty in Chuluut *sum*

Symptoms	Secondary Causes	Root Causes
Unemployment	lack of job	shortage of capital
	bad organising	laziness
	lack of basic capital	dependency thinking
		lack of assets
		lack of qualifications
		low education
		lack of electricity
Malnutrition	lack of assets	lack of hereditary assets
	lack of cash	low initiative
	bad habits	bad behaviour
	far away from market	lack of participation
		lack of livestock
		lack of cash
Bad state *ofkhot ail*	lack of food	dependency thinking
	bad habits	lack of life skills
	Jack of cash	
	laziness	
Dirty children	lack of finance	big sized family
	Laziness	bad care of children
	lack of livestock	mentally disabled
	lack of life experiences	bad discipline
		low education
		lack of innovation

The importance of the exercise was to let the groups do the analysis themselves with minimal facilitation. Since the task was not an easy one, it took some time as a lot of discussion was generated within the groups in analysing each others comments and arranging them in a cause-effect chain. The groups then presented their analyses and this resulted in a very interesting and

lively discussion. The main symptoms of poverty were identified to be unemployment, begging, bad condition of people and then- homes, lack of assets, malnutrition and passivity. The main root causes of poverty were stated to be 'laziness', lack of lifeskills, dependency thinking, low qualifications and initiative, in addition to large family size and lack of livestock and money. The emphasis on laziness was significant and this was characterised as having low intellect, 'low interest in a good life', passivity, lack of initiative and motivation, dependency thinking, reliance on assistance from others and a lack of life skills (to plan and organise) and bad training and care of children by parents. The overall impression was that these people are 'no-hopers', unable to survive alone. For example, one herder commented,

If you give them 10 sheep they know how to eat them, but not how to increase the herd", another commented,

"Even if you don't have livestock, people with good brains can survive using available natural resources".

However, this impression that all poor are lazy was challenged by the one representative present of the *sum* poor, stating that

'Not all poor people are the same".

She then went on to tell her story; a very sad account of how she and her husband had moved to the area with no possessions or a home, after losing their jobs in Dornod. Both were well educated and willing to work but unable to find employment. They had 4 children and lived in 2 rooms provided by the government, but these were in need of repair before the onset of winter. The children were unable to attend kindergarten because of the cost. She had begun a vegetable garden but had to wait another year for the crop. Her life was extremely difficult: tbmk that we are the poorest people in the *sum.* When we don't have flour and meat we have to beg, I don't think anyone else is doing this like us."

This clearly demonstrated the point that the poor are not a homogeneous group and lack of education, motivation and laziness are not universal causes of being poor.

2.2 Knotty Problem Game

To break the rather intense atmosphere created by the previous discussion the knotty problem game was played. The purpose, in addition to being a tun ice-breaker, is to demonstrate the value of group problem solving. This involved a circle of people holding hands and tying themselves into a knot whilst one person was sent out of the room. He was then called back and asked to try and untie them, using instructions only, and without breaking their hands. He was unsuccessful and was then invited to join in the circle and another knot was made. This time the group were asked to untie themselves and they succeeded in doing so very quickly, thus demonstrating in a practical way the value of working together.

2.3 Attitudes and Behaviour

The following session concentrated on the importance of attitudes and behaviour in participation and PRA. It began with an exercise on individuals' attitudes to involvement of the poor in development, whereby 4 statements were put in different corners of the room and
participants were asked to stand under the statement they agreed with most. Each group of people was then asked to justify the statement they had chosen, and this allowed the trainers to assess the attitudes of different participants. No statement was intended to be the 'right' one. each had its own validity, the intention was simply to stimulate discussion on the subject.

1. Poor people need formal education in order to make the best decisions.
2. Poor people make the best decisions when not intimidated by outside professionals.
3. Poor people make the best decisions when guided by professionals.
4. Poor people make the best decisions when working together in a group.

The majority stood by statement 1 and all were well educated people, Le., government officials and doctor. They argued that everyone, not only the poor, needed to be educated in order to have a 'good' life. "Education is the petrol of life", was one person's comment.
The next largest group was at statement 4, and this comprised of herders, 2 *bag* governors and the representative of poor in the *sum.* They argued that education did not prevent them from becoming poor and that they needed to work together using the skills they had, since they understood their problems better than others.

The final group supporting statement 3 included the *sum* governor and 3 others. They argued that if the poor are to start some form of enterprise they will need specialist support to help them and gave the example that, "you can't build a bridge without an expert who knows how to do it".

No-one stood by statement 2.

The 4 statements exercise was a good opening for the session. It was interesting that the herders and representative of the *sum* poor went together to statement 1 and that all officials were in the other two groups. This demonstrated a clear difference in their attitudes towards the role of education in furthering their opportunities and a priority amongst rural people to continue to work in a co-operative way.
This was followed by a short presentation on the importance of people's attitudes and behaviour and then small group role plays to demonstrate different non-verbal gestures, Le., dominant, participatory and respectful These were analysed by the other groups to identify the different types of gesture and the characteristic behaviour.

The role plays on attitude and behaviour were very enjoyable and as tbe evaluations showed, considered to be important by many people:
"We have realised how behaviour, attitudes and participation are important", *sum* governor.
"We have learnt how behaviour and attitudes are important for implementation of poverty alleviation", social insurance officer.

2.4 Semi-Structured Interviewing

This session demonstrated the importance of attitude and behaviour in interviewing and how to conduct good interviews which encourage a free exchange of information. The basic principles of semi-structured interviewing were introduced and then participants were divided into 2 groups to perform role plays of interviews on different subjects:

1. Possible ways of improving the conditions of a poor household in the *sum* centre.
2. Possible ways of improving the conditions of a poor household in a *khot ail.*

These were observed and commented on by the other group, identifying how well they had observed the basic principles.
The main points identified from the two role plays were as follows:
Positive points:

- opened well, not too official
- obtained detailed information
- led up to sensitive questions
- made conclusions and asked interviewees their opinions
- used key question check list

Negative points:

- continued for long tune
- asked sensitive questions too directly
- talked with only one person
- interviewers interrupted each other
- used dominating gestures, e.g. pointing a finger and waving a pen
- everybody took notes even though they had a notetaker, causing distraction
- repeated questions
- asked leading questions
- allowed people to dominate the discussion
- questions need to be more focused

the participants clearly enjoyed the role plays, however, trainers felt that they were allowed to go on too long and therefore become boring and have less learning impact. It was also felt that participants concentrated more on the subject of the interview than the techniques and that therefore the value of the session was not as great as it could have been. However, in the feedback and evaluation of the workshop, participants ranked the session as the most useful, thus demonstrating how the perceptions of trainers and participants can be quite different! It was, however, fen by the trainers that the session could be improved by changing the interview role plays from simply performing an interview on a particular subject, to demonstrating techniques, Le., a 'good* and a 'bad' interview, on different subjects.
This completed the first day of training.

2.5 Participatory mapping

The first session of the second day was on mapping techniques and their use in poverty analysis. Participants were divided into 3 groups and asked to draw maps indicating different things:
Group I. Service and opportunities map of the *Sum.* This map was created by the deputy *sum* governor, accountant, nature protection inspector and tax inspector. The map was made outside on the ground using stones, sticks, flowers, etc., and was a very detailed and impressive effort. They presented the map, describing the current situation of the entire *sum* and indicating opportunities for future development using natural resources. These included: 2 springs, one of which is a hot sulphur spring (96 degree Celsius) and the other a cold spring, both with therapeutic qualities; a place to build a tourist centre near the start of Ulziit river and a centre for fishing at the start of the river Chuluut; many kinds of animals, such as wild goats, wild cats, and a rare mountain bird whose flesh is used to treat certain illnesses; a wind power station and a gold mine. They concluded that there were abundant natural resources in the area to be exploited.

Group 2. Poverty and resource map of one *bag.* This map was created by *bag* governors and herders, on *bag* 3 (see appendix 3). They identified 174 households in 18 *khot ails,* 42 households of which were indicated to be under the poverty line. The identification of poor was based on the official *bag* statistics, known by the *bag* governor in the group. Only two of the *khot ails* had no poor households in them. This indicated an overall conclusion drawn from the training and the previous days' research, that the poor live largely in the countryside, supported within the *khot ail* unit. They also indicated the availability of natural resources in the area. They said they had used maps before for livestock accounting but never in this way or for this reason.

Group 3. Social map of *sum* centre. This map was created by the head of the governor's office, doctor, social insurance inspector, and herder. It was drawn on paper and showed in great detail the different services in the *sum* and the location of poor households. They also indicated households with large families and the sick, and those which were female-headed. Discussion arose out of this about the location of the poor and the provision of government housing for the homeless, and the seasonal variation in the number of poor households in the centre - during the winter numbers increase with people (particularly the elderly) moving due to the adverse weather and to

bring children in to school The residential patterns of the poor in the *sum* centre are therefore variable.

It was felt by the trainers that a more detailed explanation of the benefits of participatory mapping was necessary and also that the groups should have been encouraged more to work outside, since the one map drawn on the ground was extremely good, allowed greater participation and gathered interest from passers by. The weather of course, is somewhat restrictive in Mongolia, and the group was rather cold by the end!

This session took the whole morning, allowing for presentations and discussion, and again, was very much enjoyed by the participants:

The thing I liked best and understood well was the exercise on mapping" , *bag* 1 governor.

2.6 Matrix scoring

After lunch matrix scoring was introduced using the example of a matrix on supplementary income activities (see appendix 4), drawn by a poor herding household in the area during a previous interview. Participants were then divided into three groups and asked to make a matrix on different subjects related to poverty in the area. The groups were mixed-up from the previous session:

1. Best institutions for supporting poor in Chuhiut *sum*
2. Sources of income generating in Chuluut *sum*
3. Best institutions for restocking in Chuhiut *sum*

The exercise took a long time to do as the subjects, particularly 1 and 3, were quite difficult and required significant discussions within the groups. The results were extremely interesting and the group presentations caused considerable controversial debate. Since these discussions gave valuable insight into differing perceptions on the roles of local institutions, they were allowed to continue much longer than planned and the last session of the day (seasonal calendars) had to be postponed.

Group 1 consisted of the head of the governor's office, population inspector, doctor and *bag* herders.

Best institution for supporting the poor in Chuluut *sum*

Institution Criteria	Relatives	Social assistance fund	Collective of poor	Company	Inter National agency	Knot ail	Bank	Red cross
Good under* standing of pocт	5	3	3	1	2	4	1	2
ffi& trust	5	3	3	2	3	4	1	2
Financial capacity	1	4	1	1	4	3	5	3
Higb capacity to provide needs	5	4	1	1	2	2	1	3
Capacity for Iong4enn support	5	2	2	1	1	3	1	2
Total	21	16	10	6	12	16	9	12

The group concluded that according to the institutions and criteria identified by them, "the best institution for supporting the poor is relatives". The priority was very much based on the traditional roles and obligations of family to take responsibility for the care of members. The only criteria where it was not considered best was for financial support. Next were the *khot ail* and social

assistance fund, linking with the previous maps indicating high support of the poor in *khot ails* and the dependence of the poor in the centre on government assistance. The group was asked why it had not included the *sum* and *bag* in the list and they explained that these were represented by other institutions - the *bag* by the *khot ail* and relatives, and the *sum* by the social assistance fund and company. They also identified a new institution of collectives or groups of the poor which they had heard about through the government (related to the National Poverty Alleviation Programme). These did not get a high score because they said they did not know much about them. However, they felt that if the supportive activities of the *khot ail* and relatives were combined with such groups, this would be ад effective long-term support mechanism. When asked why, they answered that the poor can understand each other and their own situation more clearly than others. They felt that support to the poor should be given directly and not through intermediate levels.

A heated discussion arose from the issue of groups, with some participants arguing that the poor were unable to form their own groups without direction from outsiders, because they lacked the motivation and knowledge on how to do this, and also the conditions were not right to enable them to do this. However, this was challenged by the deputy governor, who argued that the poor should organise themselves. The representative of the *sum* poor also argued that such groups could be formed and would be advantageous because there was more trust amongst the poor. The main problem she identified with this was financial

Group 2 consisted of the governor, deputy governor, accountant, tax inspector and herders.

Source of income generating in Chuluut *sum*

	Livestock husbandry	Natural resources	Hunting	Growing vegetables	Carpentry blacksmith	Small factory	Trade	Tourism	Using scrap materials
Availability of required resources	5	5	5	2	3	3	4	5	2
Less expenditure	5	4	3	2	1	0	1	3	2
Less demand of labour force	3	4	3	3	4	3	4	4	4
Less need for technical inputs	5	5	4	3	2	2	1	3	1
Capacity of income all year	5	4	3	1	0	1	4	1	0
Capacity of reliable income	5	3	3	1	1	2	2	2	1
Less de-mand of qualificatio n	2	5	5	2	1	1	4	1	5
High level of consumptio n	5	5	5	3	3	4	2	5	1
Total	35	35	31	17	15	16	22	24	16

Participants in this group were mostly *sum* officials. They identified general resources in the *sum* and concluded that livestock and natural resources had the highest potentials for income generating activities. Before doing the matrix analysis they feh that tourism had a lot of potential, but after scoring according to the identified criteria, livestock, natural resources and hunting were found to be preferable activities.

Group 3 consisted of 3 *bag* governors and 3 herders.

What institution can best facilitate restocking

Item Criteria	*Bag*	Company	Rich people	Bank	*Sun*	Foreign organization	Relatives	*Khot ail*
Access to credit	8	2	1	9	10	0	1	1
Effective use of credit	7	3	8	5	1	0	5	6
Better co-operation	9	0	0	0	0	0	6	•10
Who can get the cheap livestock	9	0	4	0	0	0	8	10
Who can get the more productive livestock	9	0	0	0	0	0	5	10
Whom can the poor trust	10	0	5	0	1	0	3	8
Who can best manage a restocking programme	8	0	0	0	5	0	0	0
Who can best monitor the implementation	10	0	0	0	9	0	0	7
Who knows best the poor	10	0	0	0	9	0	8	7
Total	80	5	18	14	35	0	36	59

The presentation of this matrix caused the longest and most lively discussion, as it is clearly an important and controversial subject. The results identified the *bag* to be the most important institution for restocking, but other workshop participants pointed out that most of the members in this group were *bag* governors and herders, and so for this reason they gave importance to the *bag* level. The *sum* deputy governor argued that the *bag* was too small a unit to organise restocking and that this was only feasible through the *sum.* Discussion around the issue was heated, due to the variant views of the *sum* officials and *bag* representatives, but the яыти governor was adamant that restocking must be organised by local government: *"Sum* and *bag* are both local institutions of government, but the *sum* has more potential for organising, monitoring, and managing. The best institution is *sum* level". The discussion was finally ended without consensus or resolution.

The trainers feh that the session had been successful and the technique had proved to be very useful, as many opinions were heard and valuable analyses made. However, in the final evaluation of the different PRA techniques by the participants (see 2.9), matrix ranking did not receive any votes as one of the most useful - very much to the surprise of the trainers!

2.7 Diagramming: Seasonal calendar and daily routine gender analysis

The final morning's session was an introduction to diagramming and the use of seasonal calendars and daily routine analysis. This was planned as a group exercise but due to its postponement from the previous айегпооп, there was only sufficient time for a presentation. This was based on examples of seasonal calendars drawn during interviews with local herders. on 1) supplementary income generating activities and 2) income levels and the related daily analysis of gender activities in the household, showing the much greater workload of women. The presentation was followed by a discussion on how the findings from these can be related to the data obtained using other techniques and then* potential use by the participants.

1) Seasonal calendar on supplementary income generating activities in a poor herder household in Chuluut *sum*

Months **Activities**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Rope making	+	+	+	+	+	+	+	+	+	+	**~r**	+
Broom making									+	+	+	+
Selling butter						+	+	+	+	+	+	+
Selling dairy products						+	+	+	+	+		+
Selling cashmere				+	+							
Sewing	+	+	+	+	+	+	+	+	+	+	+	+
Making Mongolian boots												
Selling skins	+	+	+	+	+	+	+	+	+	+	+	+
Selling berries								+	+			

2) Seasonal calendar on income level in a herder household in Chuhiut *sum*

Months **Activities**	8	9	10	11	12	1	*2*	3	4	5	6	7
Milking	*XXX*	*XX.*	*XX*	*X*	*X*	*X*				*X*	*X*	*XX*
Killing sheep	*XXX*	*XXX*	*XXX*	*XXX*	*XXX*							*XX*
Sale of sheep	*XXX*	*XXX*	*XXX*	*XXX*	*XXX*							*XXX*
Sale of skins	*XXX*	*XXX*	*XXX*	*XXX*	*XXX*							*XXX*
Sale of animals foridish			*XXX*	*XXX*	*XXX*							
Sale of dairy products	*XXX*	*XX*	*XX*	*XXX*	*XXX*				*X*			
Sale of cashmere									*XXX*			
Selling cow hair											*XXX*	
Sale of sheep s wool												
Sale of meat to state factory										*XXX*		
Total	15	13	16	16	16	*I*	0	0	4	4	4	

Daily analysis of gender activities in the above herding household during the summer (June-August)

Men
- find horses
-send sheep to pasture
-send cattle to pasture
-churn mare airag

Women
- make tea
- make yoghurt
- hoil aaruul
- milk cows
-boil milk
-make archi
-sew
-clean
-feed children
-make aaruul
-milk cows
-cook dinner
-churn cow airag

This was followed by a game of Fruit Salad in which the furniture took a bashing and our eldest participant, a retired herder with a walking stick, refound his youthfulness!!

2.8 SWOT Analysis

The penultimate session on SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) was designed to bring the training to a focused end with a simple analysis and planning tool (for an explanation of SWOT see the Social Development Training Curriculum). It was felt that this was important in order to give the participants a practical means of using the results of PRA, to design and plan feasible projects or actions. After a short presentation small groups were given exercises to conduct SWOT analysis on a subject related to poverty alleviation and then present their results to others. The exercise was as follows:

Do a situational analysis and make an implementation plan for the following subject/project:

Group 1: Group formation
Group 2: Dairy milk production
Group 3: Potato growing

The SWOT analyses done by each group are shown in appendix 5.
It was felt that the session was beneficial but that due to the tune constraints, was too short, and thus was only able to cover the subject briefly, and give limited time for practice. As a result, the participants did not grasp a full understanding of the different steps needed to be taken to move from the situational analysis, through activity planning, to implementation planning and this was reflected in their presentations. Despite this, it was felt that they had gained a basic understanding of the principles and were able to relate the utility of the technique to the local context of poverty alleviation. In future, trainers will ensure greater time is given to this session, as it was felt to be very important by the participants in their evaluation.

2.9 Summary and Participants' Evaluation of the Workshop

The closing session was a review, emphasising again the main principles and techniques of participation and their context within development work and development planning. Finally, participants were asked to evaluate the different PRA techniques they had learnt, by voting for the two most useful and most enjoyable. As the results in the table below show, interviewing was considered the most useful, followed by the SWOT analysis - the two sessions felt to be least 'polished' and in need of improvement by the trainers! All said that they found the whole training enjoyable and therefore did not want to vote on any particular things.

Participants' Evaluation
Scoring of methods by participants

Sessions	Most useful	Most enjoyable
Interviewing	13	
Poverty analysis exercise	3	
Mapping	4	
Matrix	0	
Diagramming	1	
SWOT	7	
	28	EVERY THING

They were also asked to give their written feedback on the training overall, by answering a number of questions, given below:

1. What is the main thing you have learnt from the workshop?
2. What did you like best about the workshop? Why?
3. What did you like least? Why?
4. How could the workshop be improved?
5. Any other comments?

Some of their comments were as follows:

1. What is the main thing you have learnt from the workshop?

   'The most important things were SWOT analysis method, the analysis of poverty and behaviour and attitudes", Machgalsuren, *bag* I governor.

   " Mobilising participant's initiative during the exercises", Tsetsegmaa, *sum* doctor.

   Ч realised that we have some possibilities hi Chuhiut to improve our life. If we can mobilise poor people they have some abilities to improve then- own lives. They have the necessary skills and labour force", Khandsuren, herder.

   We have learned that we should be more active and involve more people m our work to succeed and to improve our life", Selenge, representative *of sum* poor.

2. What did you like best about the workshop? Why?

   " I most liked SWOT method, the exercises on poverty analysis and matrix method," Makhgalsurenj *bag* I governor.

   "Learning to listen to others in order to get answers you are interested in and to find out new ideas. I liked your behaviour," Tsetsegmaa sum doctor.

   "The training was excellent. We were impressed," Khandsuren, herder.

   "We learned how to exchange ideas, how to participate, how to behave," Selenge, representative of sum poor.

   "Using exercises which help people understand very easily", Dashzeveg, sum governor.

3. What did you like least? Why?

   "There was nothing I disliked", Mijiddorj, bag III governor.

   "I liked very much your training and learned lost of new things", Selenge.

   "Nothing", anon.

4. How could the workshop be improved?

   "We should be trained more in the future", Mijiddorj, bag III governor.

   "If you meet with herders they will give you very important information", Dashzeveg, sum governor.

   "You should involve more people in your training", Byambasuren, social insurance inspector.

5. Any other comments?

   "Thanks a lot for training in our place. You should exchange your ideas with rural people", Makhgalsuren, bag III governor.

   "Thank you very much for organizing this trainig and teaching us lost of useful things", Ganbaatar, bag 4 governor.

   "We would like you to organize group training here", Dashzeveg, sum governor.