

PD-ABK-021
Cm 91944

LIVESTOCK HEALTH IN SOUTHWEST AFGHANISTAN

REPORT OF AN EPIDEMIOLOGICAL STUDY AND
A PROPOSAL FOR ANIMAL HEALTHCARE DELIVERY

October 1990

JEFFREY C. MARINER DVM

WITH AN ANNEX ON INDIGENOUS KNOWLEDGE BY CATHERINE FINDLEN

FOR

MERCY CORPS INTERNATIONAL
QUETTA, PAKISTAN

INTRODUCTION:

The following report documents the animal health study activities undertaken by Tufts University School of Veterinary Medicine (TUSVM) for Mercy Corps International. This study was initiated by Dr. Albert Sollod (TUSVM) and Myron Jespersen (MCI) to improve the information base for ongoing animal health activities in Southwest Afghanistan and to assist in the design of a sustainable animal health care delivery system. The study was carried out by Dr. Jeffrey Mariner and Ms. Catherine Findlen between April and August 1990.

Dr. Mariner's objectives were: 1) to review current project activities, 2) to complete an epidemiological survey (initiated by Drs. Claire Heffernan and Chip Stem) focusing on Southwest Afghanistan, 3) to review available animal health interventions, 4) to design programs to develop new interventions, and 5) to design an appropriate and sustainable animal health care delivery system. His methods included livestock owner interviews both at refugee camps in Pakistan and in the field in Afghanistan. Whenever possible, disease outbreaks were investigated and clinical and gross pathological examinations were performed on representative cases. A computer database for animal health survey results was developed and over 1400 surveys entered. In addition, visits were made to all major non-governmental organizations that implement animal health projects inside Afghanistan, and to the Pakistani veterinary facilities in Quetta which either provide, or could provide, veterinary biologicals and diagnostic support.

Ms. Findlen's objectives were to perform an ethnoveterinary survey of *koochi* animal husbandry and cultural practices as well as further expand the epidemiological survey database both in terms of data and report capabilities. Her report on indigenous knowledge is attached as Annex A. Annex B is the animal health survey questionnaire. Annex C contains reports of the three most important diseases found in each animal specie and locale. Annex D is a glossary of Afghan veterinary terms.

ANIMAL HEALTH CARE DELIVERY SYSTEM:

The ten years of fighting in Afghanistan have led to a complete breakdown of the veterinary infrastructure in rural areas. To date, NGO's operating in Afghanistan have attempted to replace the government veterinary infrastructure through the use of either mobile teams or stationary clinics. Both of these strategies provide an effective structure for mounting vaccination campaigns and are a necessary foundation for an animal health care delivery system. On the other hand, stationary clinics suffer from their fixed location and do not really penetrate to the *koochi* camp or village level. Mobile teams are able to reach the camps and villages, but the infrequency and short duration of their visits severely limit the effectiveness of activities other than vaccination. What is required is a continued presence at the local community level that involves villagers and *koochi* in the health care delivery system.

Development experience in Africa has taught us that extensive top down veterinary services cannot function without significant infusions of development capital. Today in Africa, funding agencies such as USAID, the European Development Fund, and the World Bank are all refusing to fund animal health projects unless the funds are linked to significant policy changes. The policy changes being demanded represent a drastic scaling back of public sector veterinary services and a push towards privatization wherever possible. The emphasis is on cost recovery and self-sustainable programs. Government services are being stripped to the bare bones and are providing only those services which must be coordinated at the national level. The main activities which meet this criteria are preventive vaccination and veterinary pharmaceutical regulation. Increasingly, self-help initiatives, such as cooperatives, are being established to provide services where the governments have failed.

At present, the world's attention is focused on Afghanistan. Donor agencies are more than willing to fund relief and rehabilitation efforts. However, we must ask ourselves what will be left of these efforts once refugees are repatriated and the world spotlight has moved on to other trouble spots. Once this conflict is resolved, Afghanistan will be competing with other third world nations for development funds with the same restrictions and stipulations.

An effective model for grass-roots participation in animal health care has already been developed and tested. The essential component is the community-based animal health auxiliary (AHA) or barefoot veterinarian. This approach has been successfully

implemented in Niger¹, Nepal, India² and Pakistan (Baluchistan). The program in Balochistan is part of the Pak-German Self-Help Project for Rural Development, and over 36 non-literate barefoot veterinarians have been trained and several Pashtu-speaking communities are included in the program.

The AHA is selected by the local community and trained locally using materials designed for non-literate students. After training, he continues with his main economic activities of herding and cropping, but dedicates a small portion of his time to the provision of rudimentary animal health care at prices slightly above cost. Initially, he is supplied with medicines, a few pieces of equipment, and a treatment log book. As he exhausts his supplies, he may be resupplied by the mobile teams or area centers, but only after debriefing and accounting for all of his previous stock. The small percentage the AHA charges above cost may be retained as payment for his time. The AHA serves several purposes. He is a low-cost self-sustaining animal health care provider, a community outreach worker who promotes preventive health care, and a representative of the community who promotes the group's needs.

Services provided by the AHA would include strategic deworming, external parasite control, treatment of infections with oral antibiotics, oral rehydration therapy of neonatal animals, treatment of wounds, and closed castrations using burdizzos. The AHA would also perform extension functions such as advice on feeding for maximum production, urea treatment of straw, and the use of phosphorus and trace mineral salt supplements.

The system we are proposing is one where the clinics and mobile teams continue with their vaccinations and many of their treatment activities, much as the national veterinary service would. They should continue to move in the direction of charging for their services, as a few have begun. Some of the treatment functions, such as deworming and parasite control, will be passed on to the AHA. We wish to add to the teams' responsibilities the support of the AHA network. In this way, the groundwork will be laid for a cost effective, sustainable animal health care delivery system which continues to function under normal circumstances.

¹ Loutan, L. (1984) Veterinary Auxiliaries. In: Pastoral Development in Central Niger: Report of the Niger Range and Livestock Project (Swift, J., ed.) Niger Ministry of Rural Development and the United States Agency for International Development, Niamey, Niger, pp. 763 - 781.

² Handrill, D. (1989) Vets in Nepal and India - the provision of barefoot animal health services, In: The Barefoot Book (Carr, M., ed.). Intermediate Technology Publications, London, pp 14-19.

ANIMAL HEALTH SURVEY:

As part of the TUSVM collaboration with MCI, an animal health survey questionnaire and computerized database have been established. The questionnaire has been administered by the assistant area coordinators (AAC) traveling with the vaccination teams. They precede the team by one day and interview livestock owners about their migration patterns, animal numbers, and disease prevalence. The livestock owners are asked to describe the three most significant diseases for each species. A sample form is attached as Annex B. The AAC then describes our program, provides the herder with a vaccination card and schedules a meeting time for vaccination. The procedure actually expedites the vaccination program by providing good initial contact and reducing delays while animals are gathered from the range.

A user-friendly database written in Dbase III Plus allows us to extract information about disease significance, morbidity, mortality, and seasonality. Sample reports are attached as Annex C. In the near future, report generators which allow us to estimate *koochi* migratory patterns and animal numbers by species and district and *koochi* migratory patterns will be added to the system. At this time, over 1400 questionnaires have been entered in the system.

The survey process has allowed us to construct a glossary of Afghan veterinary terms which is attached as Annex D. Table I summarizes several of the diseases most commonly reported as diseases of primary significance for sheep, goats, and camels in three of the districts surveyed. One should note the high frequency with which livestock owners report CCPP in goats and enterotoxemia in camels as important causes of mortality. The process of asking for diseases of secondary and tertiary importance uncovered additional disease problems which would otherwise go unnoticed. An example is shown by the secondary disease report for sheep in Annex C. Zharai, or jaundice, resulting from Anaplasmosis is listed as the second most important disease of sheep in Arghastan by 14.4% of the livestock owners.

This very preliminary analysis of our survey data has yielded several important results. First, CCPP is an important disease in all the project areas where goats make up a substantial portion of the species mix. Secondly, enterotoxemia is an important cause of mortality in camels in the project zones. Finally, Anaplasmosis is causing appreciable mortality in some areas where our teams are working. We have interventions for all three of these problems and can now move forward to implement them with the confidence that our programs are based on adequate information from a representative sample.

SITE VISITS AND FIELD INVESTIGATIONS:

Peshawar (April 21-25, 1990):

Three days were spent interviewing individuals involved in the major animal health projects operating out of Peshawar. These included the UNDP, the Dutch Committee for Afghanistan (DCA), the German Afghan Foundation (GAF), MADERA, Veterinaire Sans Fronteire (VSF), and Development Alternatives Inc (DAI). I will only describe major points of interest which either confirm or contradict my conclusions.

The French groups, MADERA and VSF, had both done work in the area of mineral deficiency and supplementation. One feed analysis showed a calcium-phosphorus imbalance with a ratio of 12:1 (normal 3:1). This is generally to be expected with dry, mature rangeland grazing and no grain supplements. Trials with mineral blocks and cotton seed cake (phosphorus sources) resulted in significantly better condition, weight gain, and milk quality. No information was supplied regarding trace mineral deficiencies or exact supplement composition. Two inoperative factories for processing cottonseed cake exist in Kandahar province. The rehabilitation of cotton production, seed cake processing, and a feed distribution program is an interesting possibility for an integrated project activity.

Groups active in the region of Laghman and Kunar provinces reported the occurrence of blackleg and two mycoplasmal diseases of small ruminants, contagious agalactia of sheep and goats (CASG) and contagious caprine pleuropneumonia (CCPP). In Southwest Afghanistan we have not had any reports of blackleg and have discontinued vaccination as a result of our surveys. Caprine pleuropneumonia has been found to be an important problem in our project area wherever goats are significant. Contagious agalactia is reported as well, but only appears to be significant in the Baghran and Arghastan areas.

Several projects had experimented with Newcastle disease (NCD) vaccine delivery, however the results were discouraging. The vaccine requires a cold chain; NCD virus is one of the least thermostable viruses affecting animals, and several inoculations are required to provide protection. The Australians have developed a new thermostable food-pellet vaccine which is ideal for village chickens. The feed is merely scattered and consumed by the free-ranging chickens on an appropriate vaccination schedule. The chickens do not have to be kept under housed conditions or maintained on commercial feeds. I have recommended that this program be implemented to initiate production of this vaccine at the Veterinary Research Institute in Quetta. Suitable vaccine seeds, feed pelleting equipment, and some technical guidance from the developers would have to be obtained. Non-thermostable NCD vaccines are already produced in Pakistan, but

not in Quetta. The introduction of resistant Fayoumi chickens was also discussed and is an appropriate activity for projects so inclined.

There was no evidence that rinderpest was occurring in Afghanistan and the balance of opinion was that hemorrhagic septicemia was not a significant problem in most areas. The DCA informed me they had identified Theileria sp. in diagnostic samples. They were not clear on which species, however Theileria annulata (Mediterranean fever) is known to exist throughout the Middle East and in South Asia as far east as India.

Veterinary Research Institute, Quetta (April 4 and May 4, 1990):

The Veterinary Research Institute (VRI) has both a vaccine production unit and a diagnostic section housed in separate buildings.

The vaccine unit is currently producing three bacterial vaccines (a bivalent type B and D enterotoxemia product, anthrax spore vaccine, and black quarter vaccine). The enterotoxemia vaccine is produced in fermentation units and inactivated with formalin. The live cultures are assayed for potency prior to inactivation, however no potency or immunogenicity tests are performed on the final product. The inactivated vaccine is partially purified by hollow fiber filtration to remove non-immunogenic proteins. Of the enterotoxemia vaccines currently produced in Pakistan, it appears to be the best. The enterotoxemia vaccine is issued with a six-month shelf-life and is claimed to provide only six months protection in inoculated animals. The laboratory personnel could not provide any data to support these statements and I suspect the shelf-life and duration of immunity recommendations are relatively arbitrary.

The vaccine unit is currently expanding into viral and mycoplasma vaccine production. The plans are to produce tissue culture rinderpest vaccine, sheep and goat pox vaccine and CCPV vaccine. Ample laboratory space is available and several large pieces of equipment have already arrived. The equipment includes a lyophilizer and laminar flow safety cabinets. Further training is required in viral vaccine production and the laboratory management is interested in opportunities to place production staff on six-month training assignments.

The diagnostic unit is expanding and expects to have two new diagnostic sections functioning within six months. The current capabilities are bacteriology and parasitology. The new sections will be hematology and virology. The buildings are near complete and equipment is on order. The diagnostic lab is very willing to collaborate with an expatriate veterinary epidemiologist. The acting director stated that biological reagents are not available and any program should plan to provide their own.

In general, VRI impressed me as a progressive facility with a responsible program for expansion.

Baluchistan Livestock Department (May 5, 1990):

The Baluchistan Livestock Department (BLD) maintains a series of hospitals and dispensaries throughout the province. They mount extensive vaccination campaigns which specifically target the *koochi* people. Migratory routes have been identified and livestock agents meet herds at likely road crossings during the campaign. Diseases which are regularly vaccinated against include Anthrax, Enterotoxemia, Sheep pox, and CCPP. Interestingly enough, these are the same diseases we plan to target for vaccination in SW Afghanistan.

The BLD state they are currently experiencing problems from foot and mouth disease (FMD) but have insufficient vaccine to carry out comprehensive control measures. They are currently vaccinating lactating cattle only. They also stated rinderpest is present in Sind province of Pakistan and cases occurred in Baluchistan in 1989 from animals transported from Sind.

The livestock service claims major animal health problems in Baluchistan include: anthrax, enterotoxemia, sheep and goat pox, CCPP, FMD, lung worms, liver flukes, babesia, anaplasmosis, camel trypanosomiasis, and mange.

Baghran Trip (May 13-30, 1990):

An animal health survey trip was made to Baghran, northern Helmand Province. Stops were made at the MCI Arghastan agricultural center on May 14 and May 29 while traveling to and from Baghran.

Three mujahideen were provided by Haji Raies Abdul Wahed, the Baghran commander, as an escort from Spin Boldak to Baghran. Security was adequate at all times and no threatening situations occurred. We arrived in Baghran on the morning of May 16. The rest of the 16th, and all of the 17th were spent waiting to be introduced to Haji Raies and receive permission to begin work. At this meeting, we outlined our program and were introduced to a mullah who was responsible for enumerating and taxing the local livestock. This man stated that a population of 200,000 animals (goats, sheep, cattle and camels) was based in Baghran. Approximately 40,000 animals were reported to succumb to disease each year. Unfortunately, the vast majority of these animals, as well as the *koochi* people, had moved off to high summer pasture in Syah Band. This area was described as being five-days travel on foot and horseback. I'm not sure if this area was really that

remote or if they merely wanted to discourage me from travelling there.

Haji Raies suggested we travel with the mullah to some small remote mountain valleys to the Southwest of Baghran town and begin vaccination. We were told we could encounter 30,000 animals there. I accompanied the vaccination team and their mujahideen escort for the first three days of their ten-day excursion. It quickly became obvious that horses were a necessity for effective work in Baghran. In those three days we found approximately 900 animals, mostly goats. As the vaccination team continued on, we returned to Baghran with the intention of arranging horses and visiting as many of the more accessible areas as possible.

Upon returning to Baghran, we requested permission to visit villages in the central valley and began to visit one or two sites per day. It became apparent that Haji Raies wished to limit my travel as much as was diplomatically possible. We found very few *koochi* and village livestock owners, who typically kept only two or three cattle and a dozen small ruminants. The local people were not very well-informed about animal health problems and often had no knowledge of disease entities or desirable feeding practices.

Production levels were very low and adequate feed and nutrition seemed to be a major constraint. Alfalfa was grown and fed in the area on a limited basis, however feeding programs were not designed with any knowledge of actual growth and production needs. I encountered non-productive cows being fed entirely alfalfa and recently fresh cows which had gone dry due to diets of straw. I concluded that deficiencies of phosphorus, copper, and possibly zinc were present, based on the appearance of the livestock and problems described by the residents. Clinical signs included poor coats, hair loss, coat color changes, depressed appetites, mild chronic diarrhea, and anemia. In some villages ectoparasites, such as blood sucking lice, were very prevalent and severe. We observed one herd of 60 camels suffering from extensive sarcoptic mange. Chronic pneumonia due to lungworm infection was widespread in sheep and goats. Significant numbers of liver flukes and bile duct hyperplasia were noted in two slaughtered cattle. I also observed one case of caseous lymphadenitis and one case of contagious ecthyma in sheep.

One horse was presented with severe icterus and hematuria. Babesiosis was suspected as the cause, and blood was collected for microscopic examination. Babesia were identified in several giemsa stained smears and later confirmed by a board-certified pathologist at Plum Island Animal Disease Center. This was the only case of babesia observed and descriptions of hematuria, an important sign of babesia, from the project zone are rare.

The interview process yielded the most rewarding data. In general, goats were much more prevalent, but sheep were more highly valued. Livestock owners described anthrax, enterotoxemia, FMD, CCPP, sheep and goat pox (SGP), contagious agalactia of sheep and goats (CASG), sarcoptic mange, rabies, and hemorrhagic septicemia. Sheep and goat pox and CCPP were described as major problems and warranted vaccination. Contagious agalactia was reported to occur every two to three years, and to affect the majority of animals when it occurred. Mortality was low (10-20%), however udder damage is severe and permanent. Blindness was an additional sequelae. Contagious agalactia could be prevented by vaccination.

Camel owners complained of losses from trypanosomiasis which they call *mach* or 'fly'. Interestingly, the vectors for trypanosomiasis in this region are biting flies. One owner lost three out of four camels in one summer. The vectors were not prevalent in the high summer pastures and herders tried to send their camels to high pasture before the fly season began. We should consider supplying paravets with an effective trypanocidal drug (Neganol, a brand name for suramin is used in Pakistan).

Local people were very knowledgeable about rabies. The Pashtu term is *de levanai spey maraz* which translates as 'crazy dog disease'. They occasionally found rabid dogs (and rabid fox) in the village and these animals transmitted the disease to sheep, goats, cattle, camels and people through bites. No one could specify when the last case occurred which makes me doubt that the prevalence is extreme. Control would be problematic as all *koochi* keep aggressive dogs, and for both cultural and safety reasons, it would be difficult to implement a vaccination program. As oral rabies vaccines become available (which do not require handling of dogs or wildlife reservoirs), a rabies control program may become practical.

I was requested to treat injured mujahideen horses on three occasions. These animals were quite high spirited stallions and prone to fighting. A significant amount of time was spent managing these wounds and this was much appreciated by the commanders. During our stay, we were visited by two commanders from the Baghran/Oruzgan border who expressed interest in having MCI initiate animal health activities in their areas.

The concept of training individuals from the local communities as animal health auxiliaries (AHA) in the use of phosphorus/trace mineral salt supplements, feeding programs, the use of Burdizzos and worming medications, and the treatment of external parasites was discussed with the mujahideen and livestock owners. Both groups were receptive. These activities require a continuous presence within the group to be effective. Veterinary services are completely novel to many segments of the Baghran population

and AHAs would aid in community acceptance. The training would be performed locally and participants need not be literate. They would be provided with initial stocks of drugs and expected to charge nominal fees. They would be periodically debriefed and asked to account for any materials used before being resupplied. Part of the receipts could be retained by the veterinary auxiliary as payment for their work.

It was my impression that the most opportune time for conducting vaccination campaigns in the district was the fall and early spring. At that time, animal populations should be at their height with *koochi* and village herds returning from summer pasture. In addition, the vaccines against CCP and CASG require cold chains, and logistics would be greatly simplified by cold season campaigns. The Pakistanis claim their SGP vaccine requires a cold chain, however this does not agree with currently accepted veterinary wisdom. This mystery could easily be laid to rest by stability-testing the currently available vaccines as part of the animal health and vaccine production projects now under design. If a stability problem exists, it can easily be rectified by proper freeze-drying technique.

It was difficult to estimate the actual animal numbers in Baghran. The mujahideen figures seemed reasonable, however the disparity between what was described as being present in the remote valleys and what we actually found was disconcerting. Also, the restrictions placed on our movements and the team's unfamiliarity with local geography further hampered the work. It would be highly desirable to train some vaccinators from the Baghran district. A firsthand knowledge of the location would allow us to be more aggressive in discussions with the mujahideen.

Livestock traders were interviewed who purchased animals locally and drove them south. The final destination was stated to be Kandahar and even Pakistan. It appeared livestock marketing facilities were adequate and provided a potential source of capital for the district. An effective animal health program could lead to larger populations for sale and export.

A tractor and trailer seems adequate for work in the central valley, however horses would be much more appropriate than motorcycles for reaching many of the remoter areas. Four reasonable horses could be obtained for the price of one motorcycle and the mujahideen offered to house them for us. Purchase of feed was not discussed.

About 10% of the land in cultivation appeared to be dedicated to poppy cultivation. As we traveled south out of Baghran, this gradually increased until it reached 30% in Ghorak. The absence of vegetable cultivation was very noticeable and local staff were quite eager to implement a vegetable project. Mahmud Lal, the

assistant area coordinator for Baghran, stated all that was required was seed. Hajji Raies also requested assistance with vegetable production, coincidentally.

It was my conclusion that an effective animal health program could be implemented which focused on vaccination in the fall and spring. I do not think a full-time year-round program is warranted. AHAs would be a useful adjunct and could be maintained through the summer months by the assistant area coordinator.

Note: The vaccination team returned from Baghran on June 27 after a very successful trip. Over 49,000 animals were vaccinated in under 40 days. The team states there are still areas remaining to cover. Syah Band was only three-days' travel by foot and on horse, thus making logistics more manageable than anticipated. The team also described other areas of Ghor (Band Pasan) with large *koochi* populations at this time. I would recommend MCI make every effort to work in the Ghor province as *koochi* groups from very remote areas of western and northern Afghanistan will probably be encountered there. I would also recommend that a modest per diem be paid to teams required to travel on foot or horseback as an incentive for their extra effort.

Argghanistan (June 13 - 19, 1990):

The purpose of this trip was to conduct interviews, review animal health team activities, and confirm survey results through on site visits and necropsies. At each visit, animal owners were interviewed as to the significance and prevalence of the major suspected animal health problems, animal husbandry practices, and marketing methods. Villages visited included Gualay, Soorpan, Barazai, and Tarakay. In addition, numerous roadside interviews were held when flocks were encountered. The animal health team was observed working on two consecutive days in Gualay and Soorpan. Four necropsies were performed: two CCPP cases (*Taenia hydatigena* cysts present), one CASG case (*T. hydatigena* cysts present), and one clinical case of *T. hydatigena* disease.

The major problems described by livestock owners were anthrax (tack), enterotoxemia (lewantob), CCPP (buzmarg), SGP (kaway), internal parasites (garg), mange (pone, kash), and CASG (wochan wally). Cysts due to tapeworm larvae were very prevalent and mineral deficiency was a moderate problem. Livestock owners did not seem to have any defined concepts of either of these last two problems.

In Tarakay, one animal was presented with CASG. Symptoms included corneal opacity, severe udder edema and respiratory distress. The animal was purchased and a necropsy was performed. A typical mycoplasma lesion (3cm) was found in the right lung with consolidation and fibrin deposition. The lesion was adhered to the diaphragm by fibrin. The udder was firm, swollen and contained a serous exudate rather than milk. Six large clear fluid-filled cysts were found in the mesenteries. A diagnosis of CASG with moderate pulmonary involvement and incidental *T. hydatigena* cysts was made.

Some individuals reported CASG (wochan wally) was a major problem and epizootics occurred in some years which resulted in 100% loss of milk production for the village. In one village three animals were presented with mycoplasmal conjunctivitis, but no mastitis. The eye lesions were described as typical of wochan wally. Other livestock owners stated wochan wally had more of an endemic pattern with a few cases occurring every few months. My conclusion was that CASG was a significant problem but ranked after anthrax, enterotoxemia, CCPP and SGP.

I was told of a village (Balahara) where a disease which presented as swellings on the neck and legs and led to death in two to three months was present. When we arrived a sheep with a large fluctuant swelling (8cm) on the medial hind leg and respiratory distress was presented. The owner stated the swellings were filled with clear fluid and produced five more sheep with similar lesions. Hydatid disease was suspected and a necropsy was performed on the animal with respiratory distress. Numerous cysts were present in the thorax and abdomen. The cyst on the leg was found to be extremely large (14cm x 6cm x 5cm). The cysts were filled with clear fluid and did not occur in the the parenchyma of the lung or liver. No brood capsules or "hydatid sand" were observed. We traveled to a neighboring village where similar cases were observed. Based on the distribution of the cysts and the lack of brood capsules a diagnosis of *Taenia hydatigena* was made rather than *Echinococcus* sp. (hydatid disease). *T. hydatigena*, although very similar to *Echinococcus* in its life cycle, is much less pathogenic than *Echinococcus* and is not considered zoonotic (communicable to man). However, the clinical cases of *T. hydatigena* observed in this area were associated with significant morbidity and mortality in a small number of animals.

As hydatid disease has been reported in literature to occur in Afghanistan, a brief discussion is warranted. Hydatid disease is caused by the intermediate stage of the canid tapeworm, *Echinococcus*. It is a zoonosis which manifests itself as fluid-filled cysts containing brood capsules. They occur in the tissues of the lung and liver and have no treatment other than surgical removal. If the cysts rupture, the tapeworm scolexes will seed the entire abdomen leading to the formation of daughter

cysts which fill the entire cavity. Alternatively, anaphylactic shock leading to death may occur. Livestock and people are infected by ingesting tapeworm eggs from canid feces and canids are infected by eating the cysts discarded during sheep slaughter. Control measures for both hydatid disease and *T. hydatigena* are designed to interrupt the life cycle and include dosing of dogs with praziquantel or arecoline and care in not feeding contaminated sheep offal to dogs. Both of these interventions are problematic in Afghanistan and wild canids, such as jackals, would serve as an intractable reservoir. Education about hygiene and dog feeding practices through the animal health auxiliary program is probably the best plan of action for the future.

In Balahara area, a moderately virulent outbreak of SGP was visited. About 3% mortality was described in adults, with higher levels in lambs. Other livestock owners stated that if SGP occurred in the spring it resulted in up to 80% mortality in the lamb crop. Outbreaks of SGP in Afghanistan appear to be confined to either sheep or goats and do not cross the species barrier.

I visited one severe outbreak of CCPP in Barazai village. Only goats were affected and sick animals exhibited cough, tachypnea, nasal discharge, fever (41.5C) and areas of dullness on auscultation. One sick animal was selected on the basis of clinical signs and a necropsy was performed. Extensive consolidation and hepatization was found in one lung lobe. Fibrin deposition was not extensive. As ice was unavailable, a second sick animal was purchased for sample collection and necropsied just prior to my return. The samples will be couriered to Plum Island Animal Disease Center for agent isolation. Fibrin deposition was extensive in this case, with the lungs adhered to the rib cage. In addition, multiple infarcts were found in the cortex of both kidneys. A *T. hydatigena* cyst in the mesenteries was an incidental finding. The remainder of animals (40) were treated with LA tetracycline to observe the response to treatment. The outbreak was revisited in three days. In general, temperatures had declined to normal, however coughing and areas of dullness on auscultation persisted. The literature on both CCPP and contagious bovine pleuropneumonia states treatment is only moderately successful and frequently results in a remission of symptoms and the formation of lung sequestra resulting in chronic carriers. In an eradication campaign treatment is clearly contra-indicated because of the resulting carrier animals. At Barazai, I believe treatment saved many goats but probably prolonged the course of the outbreak.

Mortality from CCPP is reported to be high. All individuals interviewed in our animal health survey in Arghastan (180 goat owners) reported CCPP as the most important disease of goats. Based on this information, I strongly recommend CCPP vaccination be implemented.

Several old outbreaks of FMD were visited. The problems of abscess formation and hoof overgrowth were characteristic of the secondary bacterial infection and disuse resulting from the primary FMD lesions. No febrile animals with primary lesions were encountered for sample collection.

At Gualay in southwestern Arghastan livestock owners reported between 5-10% of their lambs and kids were born with angular limb deformities. This problem is caused by abnormalities of the growth plates in the long bones of the leg and results from phosphorus and/or vitamin D deficiency. Enlargement of growth plates, a sign of rickets, was described as occurring periodically.

When asked if night blindness occurred (vitamin A deficiency), villagers stated it was present when lambs were weaned in springtime. At Soorpan, night blindness was reported to occur in lambs in the fall. One *koochi* individual stated night blindness occurred during raining periods, but he would not specify a particular time of year. In general, livestock owners did not seem to have a clear idea about night blindness and gave conflicting answers about the season. I am not convinced Vitamin A deficiency is a real problem. One possible explanation for this is the large tracks of irrigated land and areas bordering irrigated lands where animals periodically have access to green vegetation. *Koochi*, who were not present in numbers at this time, have less access to these areas and may be experiencing more of a problem.

When asked, Arghastan villagers described swayback (copper deficiency) in newborn lambs. Also, paravets from Boldack have inquired about treatment for a syndrome of posterior paralysis in lambs less than one month old. Copper deficiency can be prevented by the provision of trace mineral salt or treated with oral drenches of copper sulfate.

The vaccination team at Arghastan was working efficiently and making every effort to distribute burdizzos and valbazen. Paravets reported problems with drug resupply and communication with Quetta. I explained the drug supply system was about to be re-standardized and streamlined. In one vaccination session conducted in the open, about 10% of the herd escaped prior to vaccination. The team stated that the owner had refused to bring the herd to the village, thus creating the problem. It would be advisable to supply marking dyes to assist in keeping track of animals when necessary.

Boldack (June 19, 1990):

In my brief visit to Boldack, discussions were held regarding drug supplies and observations the paravet had made regarding

major disease problems. Once again, there appeared to be a problem with timely resupply of medicines. The paravet requested vaccines against FMD, SGP and CCPP. I informed him we were considering supplying CCPP and SGP, but not FMD vaccines. The village of Shadizai, at the border of the Reg, was visited and one interview conducted.

The paravet stated that a form of jaundice without hematuria was occurring which responded to tetracycline treatment. This would suggest Anaplasmosis was the cause of the problem, and further work should be done to confirm this provisional diagnosis. At the time of my visit, no cases were occurring. The paravet also stated he had seen significant mortality in sheep during FMD outbreaks due to myocardial necrosis. Based on earlier discussions I had had with this paravet, I supplied him with Neganol for the treatment of camel trypanosomiasis.

RECOMMENDATIONS:

1. Develop an animal health auxiliary program where individuals from the community group are trained to provide very basic veterinary health care and extension work. Training should be one to two weeks long at an area center near the trainees home. Materials should assume non-literacy and consist of pictograms such as cloth flip charts and small pocket notebooks. A log book for supplies, treatments and cash record should be provided.

Subjects/Activities:

- a. Strategic helminth/fluke control and use of Valbazen
- b. External parasite control and use of Neguvon
- c. Feeding programs for optimal production
- d. Use of feed supplements
 1. Trace mineral salts/phosphorus
 2. Protein/phosphorus supplements (cottonseed cake)
 3. Urea treatment of wheat straw
- e. Use of burdizzos *closed castration method*
- f. Use of oral antibiotics such as triple sulfa or tetracycline boluses
- g. Use of oral rehydration therapy for neonatal diarrhea
- h. Wound treatment

The AHAs will be supplied with initial equipment and drugs and be periodically resupplied by the mobile teams or area centers. They should be debriefed and account for all supplies. They should charge nominal fees for treatments and be allowed to keep a portion of their receipts as payment for their services.

2. Continue with mobile vaccination teams consisting of one paravet, three vaccinators, and one tractor/trailer. In mountainous areas, such as Baghran, purchase or lease four horses per team. Expand number of teams to five by year end. Continue to investigate expansion of program into Ghor

and western provinces. Emphasis should be placed on vaccination and implementation of an AHA program.

3. Continue to search for qualified/motivated Afghan veterinarian to oversee animal health program and act as counterpart in future MCI/TUSVM animal health program.
4. Continue animal health survey through intern's term. Survey new areas as work is initiated.
5. Continue with anthrax and enterotoxemia vaccination on the current schedule. Begin vaccination of camels against enterotoxemia. Discontinue blackleg vaccination and sell existing stock prior to expiry date.
6. Implement CAPP vaccination in existing project zones during the cold season. Obtain heavy insulated chests for shipping and storage. Refrigerate stocks of vaccine while in Quetta and provide "3M" temperature monitors for vaccine stocks in the field.
7. Evaluate the feasibility of CASG vaccination (requires cold chain) based on the experience with CAPP vaccination logistics.
8. Implement SGP vaccination in Baghran and Arghastan districts during the cold season. Same recommendations apply to vaccine handling at present as for CAPP.
9. Provide marking dyes for the vaccination teams to use when herders are unable to adequately control or identify their animals. Dye use should be at the discretion of the team and not a requirement.
10. Stock adequate supplies of standard drugs at the MCI warehouse. This will ensure the most desirable formulations are always available and that paravets can be resupplied in a timely fashion. Designate an individual knowledgeable in veterinary drugs to perform ordering, local purchasing and shipping.
11. Provide sprayers and protective clothing for Neguvon application.
12. Provide Neganol to paravets for the treatment of mack or camel trypanosomiasis. Provide adequate training on its use.
13. Alert paravets to the signs, symptoms and treatment of zharai resulting from Anaplasmosis. LA tetracycline or acaprine are effective treatments. Paravets are not familiar with use of acaprine and would have to be trained

if it is introduced.

14. Prepare a project proposal with Tufts University for expansion of Quetta VRI vaccine production capabilities. Project management could be handled by MCI and technical work by Tufts.

Objectives:

- a. Determine duration of immunity of existing bacterial vaccines
 - b. Provide technical assistance in the production of viral vaccines
 1. Thermostable rinderpest vaccine
 2. Thermostable SGP vaccine
 3. Thermostable food pellet NCD vaccine
 - a. SPF egg production
 - b. Feed pelleting equipment
 - c. Heat-stable NCD vaccine strain from Australia with some technical assistance
 - c. Consider providing technical assistance in mycoplasmal vaccine production (CCPP). An outside consultant would probably be required.
15. Employ a consultant to do a detailed range analysis for species mix, mineral content, and feed value.
 16. Obtain formulations for supplements based on the findings of the range analysis.
 17. Employ a consultant to do a feasibility study for a herd reconstitution program to assist in the repatriation of Afghan refugees.
 18. Make every effort to continue work in Ghor province. Consult with Afghan staff regarding commanders and security in Ghor. Pay additional per diem to animal health teams required to travel over difficult terrain on foot or horseback.

ANNEX A

INDIGENOUS *KOOCHI* ANIMAL MANAGEMENT PRACTICES
by Catherine Findlen

TABLE OF CONTENTS

ABSTRACT	2
INTRODUCTION	3
The Study Sample.....	3
Table I. Tribal Affiliations of Koochi Who Were Interviewed.....	3
Methods.....	3
The Problem.....	3
Objectives.....	4
RESULTS	4
Background Information.....	4
Nomadic Patterns.....	5
Disease Information.....	6
Table II. Major Diseases and Some of the Reported Treatments.....	7
Management Practices.....	7
Introduction.....	7
Castration.....	7
Vaccination.....	8
Milking.....	8
Table III. Indigenous Prophylactic Methods.....	9
Shearing.....	9
Culling.....	9
Reproduction.....	10
Grazing Management.....	11
Crops.....	11
Marketing.....	11
Leadership.....	12
Herd Reconstitution.....	12
Animal Health Auxiliary Program.....	13
Selection of AHAs.....	13
Training Period.....	14
Payment for Medication and Services.....	14
Treatment of Animals Belonging to Other Tribes.....	14
Training Location and Season.....	14
Resupply Locations.....	15
CONCLUSION	15
APPENDIX A	
APPENDIX B	
Location of Winter and Summer Pastures.....	16
Resupply Location on Nomadic Routes.....	19

ABSTRACT

The word "koochi," from the Pushtu language of Afghanistan, is used to connote "one who travels" and is easily translated into "nomad." The koochi people are livestock producers, primarily of sheep and goats, who roam Afghanistan in search of pasture. Their traditional animal management practices are often sophisticated and knowledge of animal diseases precise.

Veterinary care, however, is largely unheard of or is inaccessible. As a result, large numbers of animals die of easily treated diseases. Such losses are not only economically devastating but also deplete a primary food source for the local people as well as for the koochi people. The purpose of this study is to provide in-depth information about the koochi animal management practices. This information will facilitate the design and implementation of an animal health care delivery system for Afghanistan in which the koochi people themselves will serve as animal health auxiliaries.

INTRODUCTION

The Study Sample

The koochi people of Afghanistan have suffered tremendously from the war. As a result, many have decided to leave their country and take up refugee status in Pakistan. This study was carried out in the province of Balochistan, Pakistan in the area outside the city of Quetta. Thirty-three interviews with the koochi refugees were conducted; seven took place in Muslimbagh refugee camp, 120 km. northeast of Quetta, three took place in New Saranon refugee camp, 60 km. northeast of Quetta, and 23 took place on the roadside in the area north of Quetta.

Table I. Tribal Affiliations of Koochi Who Were Interviewed

Tribe	Subtribe
Andar	Musakhil
Daftani	Hasankhil
Ghilzai	
Hotak	Tahirzai
Ishaqzai	
Lilizai	
Meryanai	Azamauel Khil
Miryanai	Azmal Khil, Pain da Khil
Niazai	Asthan Khil, Turkhi
Sulaimen Khil	Galal Khil, Ghalib Khil
Tarakai	Idal Wal, Imran Khil, Mirzai, Baramkhwshil, Mulkhil, Jamal Khil
Tukhai	Aubzai

Methods

Each interview lasted two hours and consisted of a predetermined set of questions. The interviews were conducted either in mud homes in the refugee camps or in koochi tents on the roadsides. Day trips were made to the interview locations, with the exception of two nights spent in Muslimbagh refugee camp. A Pushtu-speaking interpreter was used.

The refugees were primarily asked about their former lives in Afghanistan. This information may be directly applied to the current koochi animal management practices in Afghanistan. Some questions were asked concerning the refugees' current status.

The Problem

Due to the 10 years of war in Afghanistan, veterinary care in the rural areas has become nearly nonexistent; it is currently supplied only by a handful of non-governmental organizations. Even before the war, however, veterinary care seldom reached the koochi people and usually then

only when they traveled to veterinarians located in distant cities. This lack of animal health care incurs tremendous losses in meat, wool and milk production, as well as in animal numbers. Such losses are particularly devastating for the koochi people whose nutritional and economic well being rests entirely upon these items.

Also, as a direct result of the war, many koochi have suffered a nearly complete loss of their herds. This is true of most of the koochi refugees in Pakistan and of an unknown number of koochi still in Afghanistan. Animal losses are reported to be due to bombardment, land mines, disease, stealing by the Russians, slaughter for food, and sale. Many of the koochi refugees feel that they will not be able to return to Afghanistan unless they receive some assistance in the form of a herd reconstitution program.

Objectives

This study was performed in order to provide a database on the koochi people of southwestern Afghanistan. This database is designed to provide information on traditional animal management practices of the koochi people. More specifically, the study serves to provide information essential to the design and implementation of an animal health care delivery system currently under proposal by Mercy Corps International in Quetta, Pakistan. This proposed project incorporates the training and use of animal health auxiliaries, seventy percent of whom will be koochi people. Also, the study gives a preliminary analysis of the feasibility of a herd reconstitution program.

RESULTS

Background Information

The word "koochi" denotes one who does not own land and/or one who travels. Most koochi people also consider themselves to be maldar, or one who owns animals. There does not appear to be a specific word which encompasses both the nomadic way of life and animal husbandry. There are no negative connotations to the word koochi.

Typically, the koochi do not live in local or sedentary villages. There are, however, some people who own small parcels of land and live in local villages for part of the year and still consider themselves to be koochi. The term "koochi village" is used to describe each group of koochi traveling and living together.

The koochi are organized informally (there are no records) into tribes. Ghilzai and Durani are the two major groups to which all the koochi people belong. Within these groups are tribes which are composed of subtribes. These subtribes are occasionally divided into smaller groups. All the members of each tribe have a common, distant ancestor.

All of the people interviewed came to Pakistan between two and 12 years ago. Most reported having left Afghanistan due to the bombardments and the subsequent loss of family members and animals. Many people also reported having left due to previous imprisonment, wounds inflicted by the war, torture by the Russians, loss of men taken for the government army, interruption of their nomadic routes, and inability to care for their animals.

Nomadic Patterns

What follows is a general description of koochi nomadic patterns. Detailed information about geographical locations can be found in Appendix A and B.

Of the people interviewed, half reported spending three months in a summer location, three months in a winter location, and three months traveling between each location twice a year. This pattern varied from spending four months in each location and two months traveling between them to spending five months in each location and one month traveling between them. The primary objective of the koochi way of life is to find adequate pasture for the animals. The nomadic patterns therefore reflect the availability of grass and adapt to changes in pasture availability.

The koochi invariably travel between winter and summer locations during the spring and fall. They travel only three to four hours a day and spend from one day to several weeks in a given resting spot, depending on the availability of pasture. Also, the routes as well as winter and summer destinations, may vary slightly, depending on where the grass is found. Summers are spent in cool mountainous areas and winters are spent in warm lowland areas.

The koochi are known for their black goats-wool tents and each family owns one to three. Typically, they live in the tents all year around and do not build permanent houses. There are, however, some koochi who may live in houses for up to six months of the year. In either case, all family members and all animals travel with the group, leaving nothing behind. Due to their nomadic lifestyle, koochi children almost never attend school.

Camels are an integral part of the koochi lifestyle and are used to transport all belongings from one place to the next. An extended family may own as many as twenty to forty camels. Donkeys are also used for this purpose. Horses are expensive and are owned by men only when they can afford to purchase one. Horses are ridden by their owners and are not used to transport goods. When traveling, the koochi always walk, with the exception of sick, young or very elderly people who ride camels, and some men who go on horseback.

The koochi travel in groups ranging in size from ten families to five hundred. All people belonging to a koochi village belong to the same tribe and subtribe. When traveling, the more sizable groups tend to spread out over a large area, as is warranted by the grass availability. A group of two hundred families, for example, encountering enough pasture for thirty families, will leave that many families behind while the rest continue in search of more pasture.

Several of the people interviewed reported having specific locations on their route where they meet members from other tribes. Some groups use this location to shear their sheep in the spring before they continue on to more remote areas. More commonly, the meeting location serves as a place from which each group chooses its own nomadic route. In general, there is some contact between different tribes en route as well as in the summer and winter localities. Most of the people interviewed reported seeing and meeting other tribe members frequently, while a few reported having no contact with other groups. Several people reported using scouts to travel ahead of the group to determine the location of other tribes, as well as to find available pasture.

Disease Information

The koochi people are knowledgeable about the diseases that occur in their herds and are able to differentiate between many different diseases. They do not, however, know how to treat diseased animals with modern medicine. Many people reported having purchased medicine for various disease problems but they were unable to remember the name of the medicine. They felt that the medicine was not very efficacious, probably because they lacked the knowledge necessary for proper usage. Veterinarians are scarce and rarely visit the koochi people. Several koochi reported bringing diseased animal lung and liver to veterinarians in cities for diagnosis and drug prescription. This depended on the relative proximity between the koochi village and the city.

Traditional treatments are often prescribed for sick animals, the efficacy of which are unknown. Many of these treatments are clearly mythological (boiling a snake in animal fat) while others involve modern medical techniques (the use of diseased lung as a vaccine). Dum (prayer) is widely practiced for disease treatment, especially when other treatments are unknown. Several of the people interviewed stated that, in their koochi village, there was usually an experienced man who was known for his ability to treat animals and prescribe traditional treatments. Others stated that all men had the same basic knowledge and ability to treat animals.

Table II. Major Diseases and Some of the Reported Treatments¹

Sheep Diseases	Treatments
tack (anthrax)	prayer, shooting a bullet into the air
rikhack (diarrhea)	gambila ²
tukhai (cough)	tablets (?)
Goat Diseases	Treatments
Buzmarg (CCPP)	prayer, tablets (antibiotics)
Garg (parasites)	tablets, powder
Pone (mange)	powder
Camel Diseases	Treatments
Pone (mange)	powder
Shumack	prayer, heat application
Shashabandi (water retention)	none
Cattle Diseases	Treatments
Taback (FMD)	standing in cold water, powder, injection
Gowmarg	
Drab (bloat)	feeding oil, perforation of the rumen

¹ The list does not represent the large percentage of people reporting no treatments.

² Gambila is a woody desert plant thought to contain sulfur.

Management Practices

Introduction

The koochi people interviewed usually kept large flocks of sheep numbering from 40 to 2500 animals. Goats numbered 10 to 120 and camels zero to 60. Cattle, horses and donkeys were few in number. Most often, the animals were owned by a family with the family "elder" or father as the central authoritative figure. The sons shared ownership of the animals under his umbrella. Upon the death of the elder, the animals were split among the sons who became the heads of their own families.

Castration

All people interviewed castrated their sheep and goats. With one exception, they all used the traditional method of castration: slitting open the scrotum with a knife and pulling out the testicles. One man reported using a burdizzo forcep. Castration was performed when the animal was two to three months of age, in the last month of spring. A few people reported waiting six months until fall or one year until the next spring. The reasons for waiting this long to castrate included lack of time to do it earlier and faster growth rates of intact males. The

animals were castrated only in the cool months of spring or fall as the koochi people believe extreme cold or heat to be detrimental.

Most people reported the mortality rate as a result of castration to be between one and five percent. One man reported a mortality rate of 0 to 20 percent and another of 10 to 100 percent. They believed infection or herniation to be the cause of death and were able to relate the infection to unsanitary castration technique. Some people reported having no treatment for the infection while others said they applied a plant called spanda, mixed with flour, to the wound.

Vaccination

No one reported the use of modern vaccines and most people were unaware of their availability. Most people, however, did use traditional vaccination and other putative means of prevention. These are given in Table III below.

The efficacy of these traditional vaccination methods is unknown. As Buzmarg is a prevalent disease with high mortality, the lung vaccination is common and the koochi report that it is highly effective. Two people estimated that anywhere from two to 100 percent of the animals die from the vaccine, while most observed that the animals were sick for three days but usually did not die.

Milking

Sheep, goats and cattle (koochi people do not commonly own cattle) are milked in the spring, by women. The animals are most often milked once a day every morning, afternoon, or evening, depending on when they are brought in from pasture. Several people reported milking two times a day every morning and evening for one month and once a day for the following two months. Nutritional standards do not allow twice a day milking for more than one month. Animals are usually milked for only three months, although one man milked his animals for six months. Sick animals are never milked. In most cases, the dams are milked before the lambs and kids are allowed to nurse.

Most people were not able to estimate the milk yield per animal as all of the milk was placed in the same large container. A few people estimated that each animal (sheep and goats) gave from one-half to two liters per milking, depending on the individual and its nutritional status.

Women make several products from the milk. These products include yogurt, butter, shlumbee (buttermilk) and krut. Krut is made by straining buttermilk through a fine cloth. The solid mass left in the cloth is krut; the remaining liquid is discarded.

Table III. Indigenous Prophylactic Methods

Diseases	Methods
Buzmarg (CCPP) Zharai Kaway (sheeppox and goatpox) Zazhai	A diseased tissue (eg. lung) is pulverized and a small amount placed in a slit in the ear; or, an ear is punctured several times with a needle and a piece of diseased tissue is mixed with the blood.
Any disease	An oil and milk mixture is fed yearly.
Lewentob (enterotoxemia) Garg (parasites) Makrai (liver flukes)	Gambila is fed to the animal.
Buzmarg (CCPP)	An eyeless snake is burned and its ashes mixed with petrol. Drops of the mixture are placed on a cut made on the tail.

Shearing

Shearing of goats and sheep takes place in the spring and is always performed by men. Many koochi shear their animals while they are traveling to their summer locations, stopping along the way for 10 to 15 days in order to complete the task. Several people stated that they shear their animals in a specific location where they meet members of other tribes. These meeting places are close to the city bazaars where they go to sell their wool. Also, merchants will travel to the koochi villages to purchase the wool.

The wool from sheep is often sold while goat wool is kept to make black tents. Brown and white wool are also used in the tents but the black wool is used to cover the other colors. Sheeps' wool is also commonly used for making carpets. Both the carpets and the tents are made by men, known as akakhil, who specialize in the trade. Woven carpets of poor quality and carpets of pressed wool are occasionally made by koochi women.

The women also are responsible for spinning and dyeing all of the wool. Camel wool is sometimes, but not always, used by the koochi people. Camels shed and therefore do not need to be sheared. The wool is not sold as there are no buyers for it. It is used to make things such as pillow stuffing and matted carpets.

Culling

The koochi people do not practice a strict culling schedule and tend to keep nonproductive animals for long periods of time. Sick animals are kept as long as there is a chance of recovery

and may or may not be treated. If the animal does not recover, it is not sold but is slaughtered before death and eaten. Some people will not eat animals dying from mange or anthrax while others will eat these animals. Poor milk producers typically remain in the herd indefinitely in the hopes that they will produce more the next year. Similarly, animals not giving offspring each year are kept with the expectation that they will give offspring the next year. These animals may eventually be sold if the problem persists long enough or if there is a need for money.

Reproduction

Sheep and goats are allowed to breed in the summer months and give birth the following spring. Camels and donkeys are allowed to breed at will and are not supervised. Generally, the birthing season occurs during the trek to the summer location. Lambs and kids less than five to seven days old are carried by camels, tied on top of large bundles.

The kids and lambs are kept together, as are adult sheep and goats, and are cared for by women and children. They are allowed to nurse once or twice a day for three months after the adults are milked. Some milk is always left in the dam's udder for this purpose. At one month of age the neonates are taken to pasture by children and thus receive a combination of forage and milk as their diets. At three months of age the neonates are no longer allowed to nurse and rely solely on pasture as their dietary source. They are kept separate from the adults for another three months and finally are grouped with the adults at six months of age. At this time, they will no longer nurse.

Several people reported a mortality ranging from one to five percent due to parturition difficulties. The biggest problems appeared to be tail first and upside-down presentation of the fetus. Most men are able to assist the female in this circumstance and often the shepherd is skilled at this task.

Multiple births are reported to occur in 10 to 20 percent of the animals, with the majority of them in goats. If the health of the animals is low, no multiple births will occur.

Each year a few kids and lambs are spared from castration as replacements for the herd reproductive bucks and rams. Rams are used for two to six years and bucks for one year. The koochi consider the bucks to be of lower value and a nuisance to keep around; they prefer to sell them after each breeding season. While most people consider the rams to be of good quality some will use them as reproducers only for two years so as not to breed the male to his daughters. Other people use rams until they are too old to continue breeding. One ram is kept for 50 to 200 ewes and one or two bucks are kept for the entire doe flock.

Grazing Management

Sheep and goats are brought to pasture and cared for by a shepherd or shapana while camels are taken to pasture and cared for by a sarbon. It is estimated that each shapana is able to care for 400 sheep and goats and a sarbon is able to care for 60 camels, depending on the individual ability of the man. Families owning small numbers of animals will group their flocks and hire one shapana and sarbon for the group. Larger family flocks may likewise be tended by more than one person. If available, a male family member usually serves as the shapana and sarbon; otherwise a man in need of work is hired for the job. Payment is always in terms of goods rather than money: one out of every five male lambs, one out of every 10 female lambs and the wool of one sheep for every four. At this rate it can be roughly estimated that a yearly salary of 15,000 to 30,000 rupees or 60,000 to 120,000 afghanis is received. This estimation varies greatly as the number of animals cared for is variable, as is the price placed on these goods.

In the spring, fall and summer the animals tend to go to pasture within several miles of the family. During the milking season, which lasts approximately three months, they return to the tent once a day to be milked and to allow their offspring to nurse. Usually, the animals spend the night at pasture, away from the tents. Most of the koochi interviewed spend the winter in Registan, the desert area of southwest Afghanistan. In this area, there is no pasture for the animals and they often travel 70 km. to find grass. As a result of this distance, the animals stay away at pasture for three months. The shapana takes the animals to the pasture and is accompanied for the duration by a cook, a helper or wazgar. The sarbon and camels have a similar schedule but seek different grazing areas. Rain water is depended upon as a source of drinking water for the animals. In the event that rain does not occur for several days, water must be purchased from people owning wells or the animals must return to the family for water. There are some people, however, who do not keep their animals away at pasture for the three months of winter but, rather, live in areas where they can graze closer to the tents.

Crops

Crops or crop byproducts are purchased and fed to sheep, goats and camels as necessary and as family finances allow. Most people interviewed reported feeding barley, wheat, corn and hay to their animals at times, such as in the winter when pasture was not adequate.

Marketing

The koochi travel to city bazaars to sell their goods or sell them to merchants who come to their tents. All male animals are sold, with the exception of those kept as reproducers. The reproductive bucks and rams are also sold as they are culled from the herd. The main commodity sold at market is sheep wool. The following items are not generally sold unless there is a need for money: female animals, goat wool, krut, butter, yogurt, shlumbee and carpets.

Leadership

Three types of leaders can be identified within the koochi society; the family elder, the village elder or leader, and the mullah(s). The family elder is a patriarchal figure responsible for making all the decisions regarding family matters. Often, he is more knowledgeable than his children about animal diseases and is responsible for deciding what to do with sick animals. Upon the death of the elder, the animals become the possessions of the sons. (The daughters are married into other families). The sons become the leaders of their own families and usually choose to remain together.

The tribe leader is the authoritative figure in each koochi village. He is the chief organizer, who makes decisions such as what routes to take when the village travels to winter and summer pastures. He is also the political leader and is responsible for all dealings with the government.

The mullah is a religious leader and there may be any number of them in a given koochi village. They are often involved in making decisions for the entire group. Also, they are sometimes called upon to offer prayer for sick animals.

Herd Reconstitution

Exactly when the koochi refugees will return to Afghanistan and how they will get there is an uncertainty, at best. Most have very little money and few animals. When questioned about this matter, most of them said that they would return as soon as it is safe. They are hopeful that peace will ensue and the government of Afghanistan will give them assistance in the form of land. A few people, however, stated that they would never be able to go back as they have no resources and no hopes that they will receive assistance. When asked what kind of assistance they need in order to return to Afghanistan as koochi they replied "We need animals, how can we be koochi without animals?" According to the study the koochi people estimated that they will need 100 to 700 sheep and goats, 10 to 30 camels, and three to four donkeys, depending on family size. Clearly, these numbers represent an ideal but they are not unreasonable. The difficult lifestyle of the koochi, moving from grazing area to grazing area, would not be feasible without a sizable number of animals.

It does not appear that any of the koochi will be able to borrow money with which to purchase animals. Taking loans from friends and relatives was a common practice among them in Afghanistan but now no one has any money to lend. They estimate that they need from 200,000 to 2,000,000 rupees per family in economic assistance, with the expectation that 10 to 30 years would be required to pay the money back. Given the current price of animals and the number of animals requested, 150,000 to 900,000 rupees seems like a more realistic number. If possible, most of them stated that they would prefer to receive assistance in the form of animals and pay the debt back in cash.

Food assistance will also be necessary for the koochi as they return to their homeland. Several months supply of items such as sugar, flour and oil are important staples in their diet. Also, many koochi have been living in refugee camps for 10 or more years and no longer have tents. Many families will need to purchase tents before they may begin their nomadic lives again.

Clearly, there is great need for a herd reconstitution program among the koochi people. Most desperately desire to pick up where they left off when the war began and begin traveling their old nomadic routes. Those who are now refugees have suffered total or nearly total loss of their animals. Even with assistance, they will not be able to recover the size of their original herds. Without assistance, many may never leave Pakistan and many more will never become koochi again. As the logistics of such a program are complex, this is an area recommended for future study.

Animal Health Auxiliary Program

The koochi were questioned about the logistics of the animal health program for southwest Afghanistan proposed by Mercy Corps International. They were asked to respond to several aspects of the proposed program and their responses are recorded below.

The general response to the ideas brought forth by this program was unanimously enthusiastic. The koochi believe the AHA system to be a necessary innovation and expressed confidence that it will work.

Selection of AHAs

Koochi village elders would select the AHAs and, in some cases, the mullahs may participate in the decision. Most people feel that the mullahs were the religious leaders and therefore not likely to take part in this matter. Several people, however, believe that the mullahs would have to be involved in the selection.

The man selected will have to be experienced with animals, knowledgeable about the major endemic diseases, honest and willing. Many believe the shapana to be such a person while others see him as an estranged servant, incapable of holding the responsibility of the AHA. It is important to note that the shapana is often an employee of other men, hired to care for certain animals. Acting as the AHA, the shapana would be limited by his employer to care only for those animals. This would not be good use of a valuable person. Also as the shapana is often considered a servant, it would be difficult for the koochi people to respect the same man as a doctor because he would not hold the credibility needed. One man suggested that we train only literate men to be the AHA in order to increase their credibility. It is not likely, however, that literate people will be encountered in the search for prospective AHAs. Most of the koochi believe that any experienced man can be an AHA, as they all share the same basic knowledge about animals and diseases.

Training Period

With only one exception, the koochi people accepted a two-week training period as an acceptable length of time. The man who did not agree believed a two-week period to be too short as the AHA still would not adequately be able to diagnose disease. As the proposed scope of work for the AHAs would be limited to prevalent, easily treatable disease problems, and taking account of the indigenous animal health knowledge of the koochi, two weeks of training would be sufficient.

It would not be a problem for a selected man to leave his family and animals in order to attend training. If the man were responsible for a flock of animals, other family or tribe members would oversee it until the owner returned to the tribe.

Payment for Medication and Services

The people interviewed felt that all koochi would be willing and able to pay for medications with a 5 percent surcharge for services. Several men stated that even if they had to sell an animal to raise money, they would do so to purchase medicine that would save the rest of their animals. Only the poorest people would not be able to pay. Medicine would only be purchased if the people believed it to be useful.

Treatment of Animals Belonging to Other Tribes

Most people believed this would not pose a problem. The AHA would, however, have the obligation to treat animals from his own tribe or koochi village first. With any extra time or medicine, the AHA would be free to visit other tribes or groups. Because the size of the koochi villages varies, one AHA might not be able to attend all of the animals belonging to a larger group. If this were the case, he would not be able to care for animals belonging to other tribes as all his time would be spent working within his own tribe. Also, several of the koochi reported that they have little or no contact with other tribes, in which case the AHA would be expected to work only within his own village. For the most part, however, there is extensive contact between tribes on the nomadic routes, as well as in winter and summer locations.

Training Location and Season

There are several factors which should be considered when choosing a location and season for the AHA training. Spring is a particularly busy time for the koochi and many men would not be able to leave their animals for two weeks. It is during this time that most of the animal management occurs: parturition takes place, kids and lambs are cared for, sheep and goats are

milked, products are made and marketed, and animals are sheared and castrated. Also, most families are nomadic at this time, as well as in the fall. The winter may likewise be an inappropriate time for the training. As little management occurs at this time, it is common among the koochi to send their animals off to pasture a great distance from the village. This is significant, primarily because men are required to stay with the animals and may not be available for other activities. Also, the animals would not be available for demonstrative purposes during the training. Summer may therefore prove to be the best training season. The particularities of each chosen training location must be considered. Appendix E is a list of all of the winter and summer locations of the koochi interviewed. These locations would serve as possible training sites.

Resupply Locations

It was explained to the people interviewed that the AHA would need to purchase medicine as his supplies ran out. They listed areas on their nomadic route where it would be convenient to make these purchases. Also, the winter and summer locations are possible resupply locations (Appendix F).

CONCLUSION

It is apparent that the koochi people are in need of veterinary assistance. While these people are skillful and knowledgeable about caring for their animals, herd health problems cause major economic losses. A koochi animal health auxiliary would be easily accessible and able to care for many of these problems. It is also conceivable that the AHA program would benefit the koochi refugees as they return to their homelands. For the people returning without animals, the primary benefit would be healthier herds from which to purchase animals. In addition, with greater personal prosperity, the koochi in Afghanistan would better be able to extend credit in the form of land or money to the herdless koochi. The people returning with small herds might then be able to receive the benefits offered by the AHA.

The current situation of the koochi refugees is dire. Without resources of any kind, many are relying solely on Allah to help them return home. The trip will prove to be impossible to many if no economic assistance is received. A herd reconstitution program would be the ideal way to assist these people in the return to their nomadic lives. While it is clear that such a program is desperately needed, it is not clear how it should be designed. Future attention to this area is warranted and the fate of many lives depends upon it.

APPENDIX A

Location of Winter and Summer Pastures

Koochi winter and summer locations are listed by survey number. Also included is the training location as recommended by the koochi interviewed. Information not received is excluded. A "v" is used for village, "a" for area, "d" for district and "p" for province.

Survey	Winter Location	Summer Location	Suggested Location
1	a: Registan p: Helmand	d: Makur p: Ghazni	
2	v: Khawjagana d: Sar-i-pul p: Jozjan	v: Kuhistan d: Sar-i-pul p: Jozjan	
3	v: Imam Japar d: Sar-i-pul p: Jozjan	v: Chima Shirin d: Sar-i-pul p: Jozjan	
4	a: Yalghran d: Sar-i-pul p: Jozjan	v: Kuhistan d: Sar-i-pul p: Jozjan	
5	d: Arghandab p: Kandahar	p: Oruzgan	
6	a: Surai d: Shinki p: Zabul		
7	a: Registan p: Kandahar	a: Nawar p: Ghazni	
8	v: Katawaz p: Ghazni	v: Peshawar (Pakistan)	
9	v: Tanazhatsa p: Zabul		
10	a: Registan p: Kandahar	a: Nawar p: Ghazni	
12	a: Registan p: Helmand	a: Nawar p: Ghazni	
14	a: Khalach p: Helmand	a: Badar d: Awband p: Ghazni	
15	a: Registan p: Helmand	a: Siru d: Dai Chapan p: Zabul	
16	a: Registan p: Helmand	a: Nawar p: Ghazni	

	Survey Winter Location	Summer Location	Suggested Location
17	d: Arghastan p: Kandahar	a: Nawar d: Duwawai p: Ghazni	
18	a: Registan p: Helmand	a: Siru p: Orzugan	
19	v: Baba sashaib a: Takh-tapul p: Kandahar	a: Nawa d: Duwawai p: Ghazni	
20	d: Shurawak (Pakistan)	v: Jangul d: Karabagh p: Ghazni	Spring in Shurawak
21	v: Hazarjawt a: Garamasil d: Hazarjawt p: Helmand	a: Siru p: Orzugan	Summer in Hazarjawt
22	v: Lashkarga a: Garamasil d: Hazarjawt p: Helmand	a: Siru p: Orzugan	
23	a: Diabagh p: Kandahar	d: Kalat p: Zabul	Summer in Kalat
24	a: Registan p: Helmand	a: Siru d: Dai Chapan p: Zabul	Summer in Daichapan
25	a: Registan p: Helmand	a: Siru p: Oruzgan	Summer in Siru
26	a: Registan p: Helmand	a: Nawar p: Ghazni	Summer in Shan Joy Kulat
27	d: Hazarjawt p: Helmand	a: Nawar p: Ghazni	
28	v: Kalashamir a: Registan p: Helmand	v: Suri d: Shinki p: Zabul	Summer in Shinki
29	v: Mushanduaw a: Registan p: Helmand	v: Sadukhan Kala d: Shinki p: Zabul	Summer in Shinki
30	d: Hazarjawt p: Helmand	d: Shah Joy p: Zabul	Summer in Shah Joy
31	d: Hazarjawt p: Helmand	d: Shah Joy p: Zabul	Winter in Hazarjawt
32	a: Shurawak d: Nushki p: Balochistan	a: Nawar p: Ghazni	Winter in Shurawak Summer in Nawar

APPENDIX B

Resupply Location on Nomadic Routes

Survey	Location.....			
20	d: Makur d: Shinki d: Nawar	p: Ghazni p: Zabul p: Ghazni		
21	v: Lashkarga v: Burai v: Kalat v: Hajia Abdul Ahad v: Bailugh	p: Helmand p: Kandahar p: Zabul d: Mizana d: Dia Chapan	p: Zabul p: Zabul	
23	p: Kandahar Center v: Kalat	p: Zabul		
24	Safa Sharif p: Kandahar d: Shah Joy Center d: Makur Center	p: Kandahar p: Zabul p: Ghazni		
26	d: Makur p: Kandahar d: Kalat d: Shah Joy	p: Ghazni p: Zabul p: Zabul		
28	a: Jaldack, Sharisafa v: Rabat Baz Mohamed Khan Kalay Village Kalat City v: Wanduz	p: Zabul a: Jalclack d: Arghastan	p: Zabul	
29	a: Jaldack, Sharisafa v: Spirwan City of Kandahar	d: Pangwai	p: Kandahar	
30	Shajoy Center Makur Center Sharisafa Center	Zabul p: Ghazni p: Zabul		
31	v: Khala a: Tazai p: Sharisafa	d: Kalat d: Kalat p: Zabul	p: Zabul p: Zabul	
32	v: Luikariz Makur Center Shah Joy Center Karabagh Center	d: Spin Boldak p: Ghazni p: Zabul p: Ghazni	p: Kandahar	
33	v: Khawqani d: Arghastan	p: Zabul p: Kandahar		

Survey	Winter Location	Summer Location	Suggested Location
33	a: Shurawak d: Nushki p: Balochistan	a: Nawar p: Ghazni	Summer in Nawar

Annex B
Animal Health Survey Questionnaire

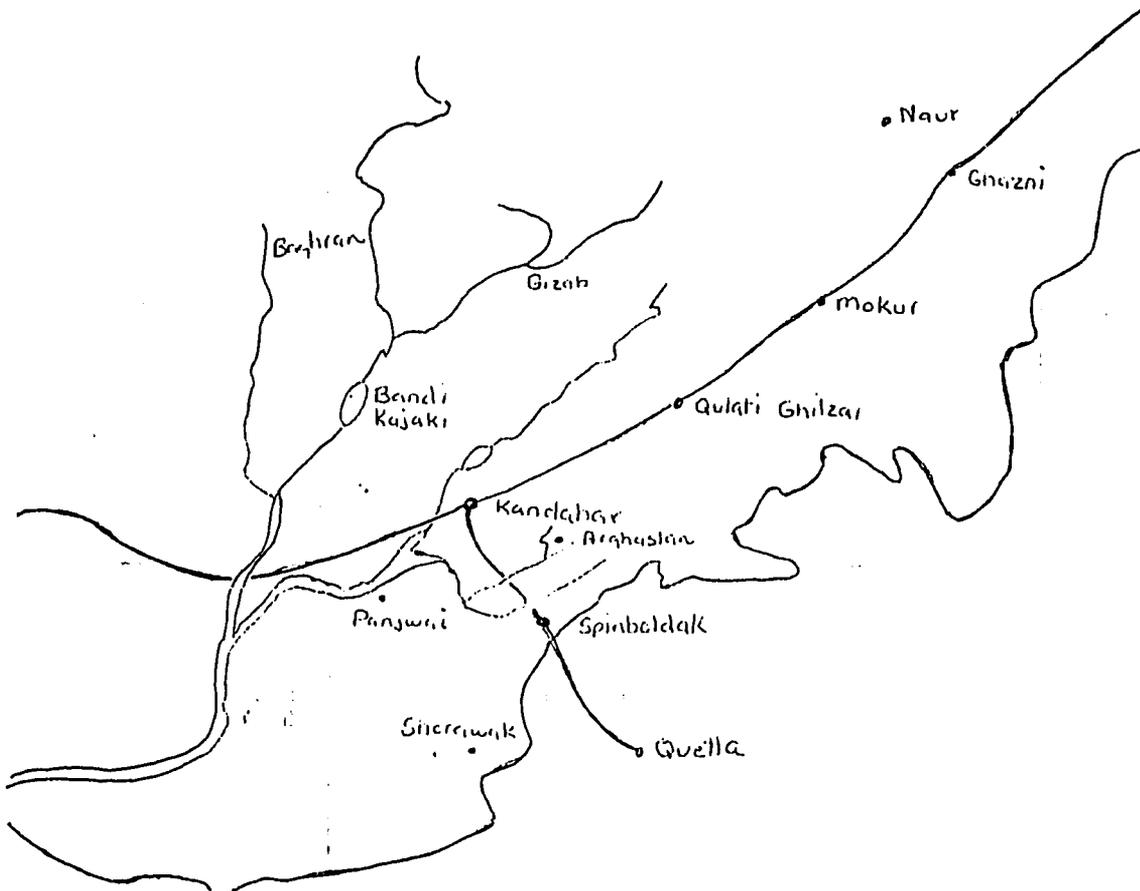
دکو چمانو په هکله معلومات

هاجبه کونکي :

ځای نوم تاريخ کوچيان ځای خلک مهاجر

- د پسر شپږ د بزو شپږ د اوشانو شپږ اودنو رو شپږ
- ۱- په کوم ځای تاسی ژمی تهر کړی (د بیا نوم)
- ۲- په کوم ځای تاسی اوری تهر کړی (بیا نوم)
- ۳- په هغو لارو کي چه تاسی سفر کړی (په لارو کي دکلو نومونه)
- ۴- په دی سفر کي څو کسان تاسو سره وه ؟
- لویان یی
- کوچیان
- ۵- د سفر په لاره کي په کوم ځای اکثره کدی را ټولیزی ؟ (د بیا اوکلی نوم)
- ۶- په کوم وخت د کال کي داسی پیښیزی ؟ (بهاشت)

نقطه :



تداوی	د مرگنمورروسته نېټې	کلینیکي علایم	د مروفیصدې	د مریضانوفیصدې موسم	مرض
					پېل - ۱ - ۲ - ۳
					پېزی - ۱ - ۲ - ۳
					غواڼی - ۱ - ۲ - ۳
					اوبن - ۱ - ۲ - ۳

ایا تاسو په حیواناتو کې نورې مریضې مته چه انسانان په
اخته کیزی •

حینی ثوری مریضی چه په اقتصادی لحاظ مُضر دی •

۲۲

ایا تاسو حینی غلې هم کری • او هغه غلې اویا دهغه پرور
یا پاتنه سونسی حیوانا تو ته ورکوی •

Annex C
Animal Health Survey Sample Summary

PRIMARY SHEEP DISEASE

DISEASE	BALUCHISTAN	GHAZNI	HELMAND	KANDAHAR	ZABUL	TOTALS
ABCESS				2		2
ANOREXIA			1			1
ANTHRAX	2	21	17	138	14	192
CONTAG. AGALACTIA			2	3		5
DARD			1			1
DIARRHEA	1	17	7	58	11	94
ENTEROTOXEMIA		6	1	7	3	17
FOOT & MOUTH	1		1	3	3	8
HIZ				2		2
JAUNDICE			5	11	1	17
LICE					2	2
LIVER FLUKES	1			2		3
LUNG WORMS				2	5	7
MANGE				2	3	5
MASTITIS		2		5	3	10
NAKHAK			1			1
PARISITES		5	1	37	10	53
PNEUMONIA		11	2	61	13	87
POX		3	2	16		21
SHRUE			1			1
SKIN NECROSIS		1				1
SWELLING			1			1
TETANUS				1		1
TRYPANOSOMIASIS			2			2
WOUNDS		2		8	2	12
TOTAL SURVEYS	5	68	45	358	70	546
TOTAL SHEEP	1,910	12,904	29,612	39,556	16,608	100,590

BEST AVAILABLE COPY

PRIMARY GOAT DISEASE

DISEASE	BALUCHISTAN	GHAZNI	HELMAND	KANDAHAR	ZABUL	TOTALS
ANTHRAX	1	3	5	2	3	14
CHAMBRY			1			1
CONTAGIOUS CAPRINE P.PNEU	2	54	52	193	47	346
CONTAGIOUS AGALACTIA			1			1
DIARRHEA		3	4	20	7	34
ENTEROTOXEMIA		1		7		8
FOOT & MOUTH	1	1	1			3
HIZ				1		1
LIVER FLUKES				2		2
LUNG WORMS					1	1
MANGE			4	39	2	45
MOUTH SWELLING					3	3
PARASITES	1	2	7	52	2	64
PNEUMONIA		3	1	5		9
POX			1	3		4
TOTAL SURVEYS	5	67	77	324	65	538
TOTAL GOATS	695	1,994	11,183	12,424	1,269	27,565

BEST AVAILABLE COPY

PRIMARY CAMEL DISEASE

DISEASE	BALUCHISTAN	GHAZNI	HELMAND	KANDAHAR	ZABUL	TOTALS
ANGÉE		19				19
CHAMBRY			1			1
CHAMBARACK			4			4
DIARRHEA		2			2	4
ENTEROTOXEMIA		10		22	10	42
GHBAN WAHONAI			1			1
JAUNDICE		1			1	2
KAISARIA	1					1
MANGE	3	13	2	40	26	84
PUST CHACK					1	1
PARASITES		3	6		9	18
PNEUMONIA		15		1	12	28
POX		1			3	4
URINE RETENTION				6		6
SKIN NECROSIS				2		2
RABIES					1	1
TRYPANOSOMIASIS	1					1
SHORT BREATH					1	1
TOTAL SURVEYS	5	64	14	71	66	220
TOTAL CAMELS	110	684	42	591	713	2,140

BEST AVAILABLE COPY

46

PRIMARY CATTLE DISEASE

DISEASE	BALUCHISTAN	GHAZNI	HELMAND	KANDAHAR	ZABUL	TOTALS
HEMORRHAGIC SEPTICEMIA			7			7
DRAB			2			2
FOOT AND MOUTH			3	5		8
MALNUTRITION			1			1
TOTAL SURVEYS			13	5		18
TOTAL CATTLE			31	3		34

BEST AVAILABLE COPY

Annex D
Glossary of Afghan Veterinary Terms

Glossary of Afghan Veterinary Terms

Afghans have a remarkably good sense for clinical diagnosis and have specific names for most of the major disease entities. The only significant conditions/diseases which they did not have terms for or an understanding of were mineral deficiencies and cystic disease resulting from intermediate forms of tapeworms.

Disease Names:

Buzmarg: (Farci) Contagious caprine pleuropneumonia. The literal translation is 'goat killer' and it occurs mainly in winter. The animals suffer from coughing and respiratory distress. If a necropsy is performed the lungs are white and stick to the rib cage. This clearly suggests fibrin deposition and is characteristic of CCPP. It is reported to be an important disease in mountainous areas of Laghman and Kunar provinces where Madera is practicing vaccination. MCI assistant area coordinators believe buz marg is an important disease in the Arghastan and Spin Boldack which warrants vaccination. In Baghran, where goats are a much more important species, CCPP is also a major problem. Our surveys and interviews support these views.

Ciel: Tuberculosis.

Chichak: (Dari) Pox disease. This is a term used by Pathans to refer to either sheep and goat pox (SGP), fowl pox or camel pox. These diseases are widespread but are not resulting in high mortality in all areas. SGP is resulting in significant mortality and abortion in Baghran and Urozgan.

Da ghulanzu parsub: Mastitis. The literal translation is 'udder swelling'.

Garg: A general term referring to parasite infestations including mange, lungworm, gastrointestinal helminths, and liver fluke infection. Pashtu dictionaries translate garg as mange, however use of this term is very broad and non-specific. Pone is a more specific term for mange in goats and camels. There are more specific terms for lungworms (spansai) and liver flukes (paani) however garg is the most commonly used. Symptoms of garg due to lungworms include coughing and nasal exudate. Fine worms are sometimes coughed up. Worms are found in lungs if a necropsy is performed. Liver flukes are also observed in the liver. Herders claim systemax cures garg, however systemax is not highly effective against liver flukes. When asked to present animals suffering from garg, animals were shown to have eggs of Dictyocaulus filaria on pharyngeal swab.

Gowmarg: (Farci) Hemorrhagic septicemia. The name means 'cow killer'. Syndrome includes sudden death, salivation and lameness. They believe the disease may be spread to new areas by transportation of infected meat.

Kash: Mange. This term is used in Arghastan specifically for sheep mange. In the one case observed, the entire body was affected by alopecia and severe crusting and scab formation. The clinical appearance was consistent with Psoroptic mange.

Kaway: Sheep and goat pox. An Urozgan herder described fairly high mortality in young animals (25%) and significant morbidity in adults. I observed two severe cases of goat pox in Sukrab refugee camp which were described as what is typically seen in Afghanistan.

Khulakhuzy: Orf. Several cases of orf were observed in Baghran and Arghastan.

Lawai: Pneumonia of sheep. This disease occurs in summer and fall. The postmortem description of the lungs is suggestive of Pasteurellosis with a typical cranio-ventral and cardiac lobe distribution, abscess formation, and pericarditis.

Lewantob or Lewanai: Enterotoxemia occurring in both camels and sheep. The word means 'crazy' and refers to the neurologic signs associated with this disease. It occurs during spring when feed conditions improve and is characterized by a rapid course (24 hours), diarrhea and neurologic signs (tremor).

Levanai spey maraz: Rabies. The literal translation is 'crazy dog disease'. Rabies in local dogs and wild fox is a common problem. Villagers interviewed in Baghran are aware that dog bites transmit rabies to livestock and people.

Mach: Camel Trypanosomiasis or Surra. Mach means 'fly' in Pashtu and refers to a disease which the *koochi* believe results from the bite of large flies (probably Tabanids). This has been described as a chronic disease with a course of 2-3 months. Some *koochi* state the disease leads to swellings or abscesses over lymph nodes. The animals are depressed and recumbent. Usually they sit facing the sun. Except for the abscessation, the description of mach agrees well with the clinical picture for Camel Trypanosomiasis. The Baluchistan Livestock Service volunteered the name mach as the Pashtu translation for Surra when asked.

Makrai: Liver fluke and intestinal worms. The literal

translation of makrai is 'tadpole', but Afghans often use this term to refer to internal parasites.

Paani: A descriptive term for liver flukes. Paani means 'leaf' and refers to the shape of the fluke. Herders are well aware of this parasite.

Pishak: Ringworm.

Pone: Mange. Usually reserved to describe severe zoonotic mange in goats and camels. It can result in almost total hair loss in goats with severe dermatitis. The descriptions clearly suggest sarcoptic mange.

Qusar: Type of tetanus, always fatal.

Rindack: (Pashtu) contagious skin necrosis of camels. This is described as lumps (abscesses) which develop mainly in the gluteal region or the side of the neck. These progress to open and drain after 5-10 days. They may become flyblown (myiasis) if not properly cared for. This corresponds to textbook descriptions of contagious skin necrosis. The etiology is poorly understood, but probably bacterial in nature. Treatments range from superficial cleansing of draining sinus to systemic antibiotics (Pen/Strep) in generalized cases. The frequency in Arghastan has been described as 4-5% in the spring.

Rikhack: Diarrhea, none specific, may be used to refer to enterotoxemia or any other form of diarrhea.

Roghban wahony: Etiology unclear. An acute disease to camels associated with swelling of the legs. The muscle tissue (meat) is described as soft. Death occurs 2-3 days following initial signs. This is possibly hemorrhagic septicemia.

Saborzi: Anthrax. This term is used in Baghran to describe a disease which results in sudden death in sheep and causes blood-filled blisters in people which consume the meat of affected animals. Many people insisted this was not the same disease as tack. I concluded from their descriptions that saborzi was term reserved for outbreaks of tack where human cases occurred.

Sazhai chinjai: Lungworms.

Shashabandi: Urine retention.

Shiro: Mastitis

Shirobad: Contagious agalactia of sheep and goats (CASG).

Baghran people use this term for a severe epizootic disease which corresponds clinically to CASG. It occurs every 2 to 3 years and reportedly causes severe losses.

Shumack: Enterotoxemia. A disease of camels associated with neurologic signs and sudden death. This is a synonym for lewanai.

Spansai: Thread-like worms coughed up from lungs. (dictyocaulus filaria)

Spazhi: Lice infestation.

Surra: Trypanosomiasis of camels caused by *T. evansi* and transmitted by biting flies (Tabanids). Paravets describe enlarged prescapular lymph nodes. *Koochi* report up to 30% mortality in sheep as a direct result of tabakh. Death occurs 2-3 days following initial signs. The paravet from Boldack described heavy mortality in lambs associated with necrotic lesion of the heart (similar to early tiger heart lesions in young cattle). Blood and Henderson describes this as a rare but recognized complication in sheep. No serotype information for this area is available. As FMD vaccines must be type-specific and generate only limited duration of immunity, it would be unwise to target FMD for control at this time.

Tack: Anthrax. The word means 'gunshot' and refers to the peracute deaths resulting from this disease. It is probably the most important disease of sheep and cattle.

Tawun: Rinderpest (RP). No evidence was found indicating rinderpest is present in Afghanistan. The Baluchistan Livestock Service has told me RP is prevalent in Sind province and occurred in Baluchistan province last year (1989) in animals transported from Sind.

Toqhakay: Newcastle disease (NCD). Clearly this is an important constraint to village poultry production. The NCD vaccines currently available in South Asia require a strict cold chain and a multidose regime to be effective. This is beyond current infrastructure and program capabilities. A thermostable food pellet vaccine designed for free ranging village poultry has been developed in Australia. I strongly recommend this technology be implemented.

Tokhai: Camels: pneumonia. This disease is characterized by cough (tukhai) and weight loss. Lung lesions are described as being very similar to buz marg (CCPP) and include fibrinous adhesion to the chest wall. Streptomycin has been described as an effective treatment. It has been claimed that recovered animals are protected for life. Differential

diagnosis include pasteurellosis.

Wochan wally: Contagious agalactia of sheep and goats (CASG). Herders described this disease as the total cessation of lactation combined with arthritis and ocular. It is caused by Mycoplasma agalactia and the infection results in severe udder edema, severe mastitis, corneal ulceration leading to blindness, and arthritis of the pastern and fetlock joints. A synonym for wochan wally is shirobad.

Zharai: Jaundice. Usually given as a disease name and not a symptom. Numerous interviews with *koochi* and veterinary staff have described a syndrome of jaundice, depression and anorexia which frequently leads to death. Zharai is not associated with hematuria (red water) and this suggests Babesiosis is not the cause. Cases are reported in both winter and summer. The animals are usually being grazed on moist pastures called chamen. Most herders report liver flukes are present if affected animals are slaughtered. They do not, however, generally attribute zharai to fluke occurring in late spring, which was cured by LA tetracycline. It was our conclusion that the zharai being seen in summer in Arghastan and Boldack is the due to Anaplasmosis.

Zhazi: Sheep and goat pox. A pashtu synonym for kaway.

Disease Names of Unknown Significance:

Tandi rinmack:

Hiz

Warkharai: Diarrhea.

Signs and Symptoms:

Dani: Abscess or cyst-like lesions.

Kharish: Scab.

Larza: Shaking, tremor.

Parsub: Swelling.

Taba: Fever.

Tanaki: Blister.

Tukhai: Cough. Also used as a general term referring to

pneumonia.

Washa nakhuri: Anorexia.