1. Reindeer (Rangifer Tarandus) and Yak (Bos Poephagus and Grunniens): Disparate Animal Species - Similar Environment, Similar Management, Similar Parasite Problems? (4-9 Sep 2000)

P.J. Waller
SWEPAR, National Veterinary Institute, SE-751 89 Uppsala, Sweden. E-mail: Peter.Waller@sva.se

Reindeer (Rangifer tarandus) inhabit most of the circumpolar land areas not covered by permanent ice in the Palaearctic (Eurasian) and Nearctic (American) regions of the northern hemisphere. In the northern areas of Sweden, Norway and Finland (Fennoscandia), home to the Saami people, reindeer are a crucial resource and large populations are maintained under semi-domesticated situations. There has been departure somewhat from the transhumance type of management in recent years, but still these animals are herded extensively on alpine pastures and browse, in accordance with the seasonal availability of feed. In many ways, this approximates the management systems for yak (Bos grunniens) in the cold, high altitude areas of Central Asia. Therefore, it is not surprising that similar species of parasites (both internal and external), with similar features and rank order of importance are found in these two quite different animal species. The warble fly (Hypoderma spp.) is generally regarded as the most important parasites of both reindeer and yaks. The immature stages cause considerable stress to the animal through the migratory activities, and economic loss due to damage of the hide following the emergence of the pre-pupal stages. For reindeer, the incidence of infection can exceed 95% of the herds. Hypodermosis, particularly of the white yak populations in the Tianzhu region of China, is a particularly serious disease with prevalence of infection approximating 100% and responsible for great losses in productivity.

Gastro-intestinal nematode parasites are also important in both reindeer and yak. In the former animal species, the abomasal parasite Ostertagia gruehneri is the most common and economically important. Yaks have been shown to harbour a range of nematode species, similar to those found in cattle in the cool temperate regions of the world, with Ostertagia spp. considered to be one of the most important internal parasites. Control of these parasites is essential if economic losses are to be reduced, or avoided, for both reindeer and yak production. This poses many logistical and practical problems which are not associated with control of parasites in more sedentary systems of livestock management—such as for cattle, sheep and goats.

All rights reserved. Document No. P0293.0900.

2. Drug Susceptibility Test of E. Coli Isolates From Healthy Yaks of Qinghai (4-9 Sep 2000)

Y. Tian¹, C. Lu¹ and L. Xiao²
¹College of Veterinary Medicine Nanjing Agricultural University, Nanjing 210095, China. E-mail: dvmi@njau.edu.cn
²Faculty of Agricultural and Animal Science, Qinghai University, Xining, 810003, China.

Little data about the susceptibility of E. coli in healthy yaks to antibiotics were available. Paper diffusion susceptibility test was applied in the drug susceptibility test of 68 strains of E. coli isolates from healthy yaks in Qinghai to 12 antibiotics. The results showed that among 12 antibiotics the inhibitory effects of Norfloxacin and Amikacin were the highest and 100% strains were susceptible. The effects of Ciprofloxacin, Chloramphenicol, Ampicillin, Gentamicin, Trimethoprim/
Sulfamethoxazole, Kanamycin, Tetracycline and Streptomycin were medium and 52.9% to 98.5% strains were susceptible. None was susceptible to Penicillin and Rifampin. It suggested that acquired drug resistance was not an actual problem on *Escherichia coli* strains from flocks of healthy yaks in Qinghai, which were rarely given antibiotics.


H.E. Geilhausen  
Yak and Camel Foundation, P.O. Box 10, D-25359 Krempe, Federal Republic of Germany. E-mail: horst.geilhausen.hg@bayer-ag.de

From a 330 head white yak herd 50 (approx. 15%) blood samples for serum preparation were taken. The objective of the study was to determine the immune status of the examined animals concerning viral and bacterial antigens. Considering the most important infectious diseases of cattle, as viral antigens Bovine Herpes Virus 1 (BHV1), Bovine Viral Diarrhea/Mucosal Disease (BVD/MD), Parainfluenza 3 (PI3) and Bovine Leucosis Virus (BLV) were used. To determine typical bovine bacterial antibodies *Brucella* spp., *Chlamydia* spp., *Coxiella burnetii*, *Salmonella* spp. and Paratuberculosis were involved. Negative results revealed for Bovine Leucosis, *Brucella* spp., *Salmonella* spp. and Paratuberculosis. A positive antibody status could be demonstrated in 96% of the samples for PI3, 34% for BHV1, 18% for BVD/MD, 24% for Chlamydia and 2% for *Coxiella burnetii*. Surprisingly the herd seems to be negative against Brucellosis. Brucellosis normally plays an important role in yak and man in the Himalayas. The positive percentage concerning BHV1 and PI3 seems comparable to cattle in other regions of the world. Relatively high appears the incidence of Chlamydia. Compared to cattle in other countries of intensive breeding, BVD/MD percentages of 70 - 80% are average and 18% positive animals show under this circumstance a low incidence rate.

**4. Treatment of Bovine Mastitis with Medicinal Herbs and Acupuncture** (4-9 Sep 2000)

S. Hu  
Department of Veterinary Medicine, College of Animal Science Zhejiang University, Hangzhou, 310029, Zhejiang, China. E-mail: hush@mail.hz.zj.cn

Mastitis is the most common disease in dairy cows. Widespread use of antibiotics for the treatment of this disease has a potential to cause contamination of milk, which has become a subject of public concern. Medicinal herbs and acupuncture are natural and safe approaches, and have received attention from more and more veterinarians. Based on the clinical signs and manifestations, mastitis is usually classified into three patterns: domination of "heat pathogen", stagnation of Qi and blood, and deficiency of Qi and blood. Four herbal prescriptions for the treatment of different patterns of bovine mastitis are described. They are Powder of Dandelion, Decoction of Snakegourd and Burdock Achene, Ease Powder, Decoction of Eight Precious Ingredients. Laser-acupuncture therapy is also introduced.

**5. Mastitis Control in Ruminants** (4-9 Sep 2000)

K. Persson Waller  
Department of Obstetrics and Gynaecology, Faculty of Veterinary Medicine, Swedish University of Agricultural Sciences, Box 7039, SE-750 07 Uppsala, Sweden. E-mail: Karin.Persson.Waller@og.slu.se
Mastitis is a multifactorial and costly problem worldwide and can occur in all milk-producing ruminants. It affects not only animal welfare, but will also result in decreased milk production and deterioration of the milk quality. A healthy mammary gland is a result of a complex balance between the cow, the microorganisms and the environment. Decreased disease resistance in the cow, increased virulence of the microorganisms or increased burden from the environment will result in mastitis. Mastitis can be difficult to treat successfully. Therefore, it is important to identify risk factors in order to be able to prevent the disease from occurring. It is important to make the farmer aware of the problem, and to make him/her understand the importance of good management and environment. In many countries some kind of control plan is recommended. The yak is an important source of milk for millions of people in Asia even though the production per cow is low. So far, there are few reports on mastitis in yak. Whether this is due to a high resistance against infections in the mammary gland, or to a lack of investigation into the problem, is not clear. Crossbreeding of yak with more high-producing breeds will increase the milk production, and the risk for mastitis. Therefore, it is important to increase the knowledge about mastitis in yak and the risk factors involved in yak milk production. In this paper, the aetiology of mastitis will be discussed, together with predisposing factors, such as housing, feeding, genetics and milking, as well as different ways to control the disease.

All rights reserved. Document No. P0297.0900.

6. A Diagnosis Study of Brucellosis and Chlamydia in Yaks (4-9 Sep 2000)

L. Ma
The Qinghai General Station of Veterinary and Animal Husbandry, Xining 810001, Qinghai, China.

After many years of S2 vaccine inoculation in yaks, a diagnosis study including SAT for brucellosis and IHA for chlamydia was conducted using 526 serum samples from uninoculated yak calves over 8 month old in the vaccinated area. In the study it was found that there was one positive serum sample in SAT and were 15 positive serums samples in IHA. It was proved that, after controlling the brucellosis prevailing, the chlamydia has been become a main disease causing yak abortion. Therefore, it is needed to pay more attention to this disease in future.

All rights reserved. Document No. P0298.0900.

7. Effect of Japanese Kampo Medicines (JKMs) on in Vitro Preservation of Bovine Spermatozoa and in Vitro Fertilization (4-9 Sep 2000)

Y. Nakaya1, R. Zhang2, Y. Xi3 and N. Fujihara3
1Animal Resource Science Section, Faculty of Agriculture Graduate School, Kyushu University, Fukuoka 812-8581 Japan. E-mail: ochotona@agr.kyushu-u.ac.jp
2Department of Animal Science, Gansu Agricultural University, Lanzhou 730070, China.
3Captive Feeding and Breeding Center for Crested Ibis, Yangzian 723300, P.R. China.

In this experiment, four kinds of Japanese Kampo Medicines (JKMs) syohangekabukuryoto, hotyuekkito, ogikentyuto, ninjin-eiyoto and mixed JKMs were investigated to evaluate as one of the factors for improving physiological function of frozen-thawed bovine sperm motility when semen samples were incubated for 22h at 37º in medium 199 supplemented with JKMs. Following the experiment with spermatozoa, in vitro fertilization (IVF) and subsequent embryonic development of bovine oocytes treated with JKMs-processed spermatozoa were examined. As the results, some of the JKMs slightly improved the motility of frozen-thawed bovine spermatozoa, associating with increased rates of in vitro fertilization of bovine oocytes. Slightly increased percentage of in vitro fertilization was also observed when the JKMs were added to the medium PBS.

All rights reserved. Document No. P0299.0900.
Best quadruped cloven-footed sustainable and proliferative bovid for the highlanders is yak. They are considered to be one of the hardiest animals—which rarely suffer from any disease. However, yaks become susceptible to many diseases affecting cattle. Till today several diseases like parasitic, bacterial and viral, poisoning and of systemic disease have been encountered in India as well as abroad. Foot and Mouth Disease (F.M.D.) has been reported from all yak rearing countries. A number of outbreaks in different parts of China, Nepal and India in yak as well as in its crosses have been reported by various researchers. Rinderpest has also been reported in Nepal and India, however, it has been eradicated successfully. Among other viral infections pox, vesicular stomatitis, rabies etc. have been reported sporadically by various authors. In some parts of the world, contagious bovine pleuro-pneumonia was thought to be the biggest killer of cattle next to rinderpest. The pasteurellosis was reported to occur every year in yak producing areas and takes the form of haemorrhagic Sepicaemia. Mastitis occurs in yak, but it is believed that the incidence is less than dairy cattle. Among other bacterial infections, tuberculosis, anthrax, black quarter, contagious bovine pluro-pneumonia and botulism were recorded from USSR, Tibet of P.R. China and other yak rearing countries. In India, there is no report of TB, which may be due to non-conduct of systemic research in that aspect on hilly yak tracts. The salmonellosis is also common among yak in China, mostly among calves between 15 and 60 days of age. The causative agents are mainly *S. typhimurium, S. dublin and S. newport*. Calves scour in yak calves are reported as a major cause of loss in two studies in yak from their birth to 40 days old. *E-coli* is the major causative agent. A high incidence of scouring in calves could, it is thought, be associated with the custom of tying up calves at the same place at the camping site for several months at a time, resulting in poor hygiene. Among other bacterial diseases producing toxin, *Clostridium and botulinum* (type C) are significant in Tibet. Brucellosis and Leptospirosis are common among the yak in Nepal, former USSR and Mongolia and its crosses and the more important because of its readily transmittancy to man. Parasitic infections (ecto and endo) in yaks are eggs of helminth parasites of *Bursate* worms, *T. globulosa*, *Neoascaris vitulorum*, *Dicrocoelium dendriticum*, *Fasciola gigantica*, *Cysticercus tениcollis* and also *Trichurus*. In USSR, fascioliasis, lung and liver echinococcosis, moneiziosis, telesiosis and brain coenurasis have been reported. Yaks are susceptible to various haemoproteozoal infections when they are driven to warm lower altitude. Among other parasites, protozoa like *Sarcocystis, Eimeria* and Botfly hypoderma have been reported from China. Hydatidosis in adult yaks, *Neoascaris vitulorum* in young calves and Toxocara, Trichuris, Eimeria and Dicrocolium species has been reported from India. Liver fluke is a common condition in yak of China and elsewhere. Many genera of roundworm were isolated but the prevalence of different genera varied with the time of year.

Ticks, lice and mites have all been found in yak. Various species of flies (*Musca sp.*, *Sarcophaga sp.*, *Tabanus sp.*, *Lucillia sp.*, *Chrysomia sp.*, *Calliphora sp.*, *Simulium sp.*, *Stomoxys sp.*), ticks (*Boophilus, Ixodes* and *Hyalomma*) and lice (*Damalinia sp.*) have been identified. Helminthic infections of strongyles, hook worm, *dicrocelium, ascaris* and *trichurus* were reported from India. Among the poisoning cases, *Senecio* poisoning is an emerging problem among the yak rearers, particularly in India and Bhutan. It causes a syndrome of haepatotoxic insufficiency in bovines. The general symptom of the yaks are sudden inappetence with fluctuation of body temperature, rough body coat, anemia, gingivitis, discrete necrosis in tongue, gum, buccal mucosae, ulcerative lesions in muzzle, teat, scrotum, hooves and in coronets as the disease advance.

All rights reserved. Document No. P02100.0900.

---

**9. Test of Enterotoxicity of *E. coli* from Yaks** (4-9 Sep 2000)

Q. Zeng¹, M. Cheng¹, B. Zhang¹, Q. Song¹ and J. Wu²

¹Department of Animal Science and Veterinary Medicine, Tibetan Agriculture and Animal Husbandry College, Linzhi 860000, T.A.R., China. E-mail: xzzwl@sina.com

²College of Animal Veterinary Medicine, China Agricultural University, Beijing 100094, China.

Three strains of enterotoxigenic *E. coli* isolated from dead yaks were cultured on the improved Mundell medium and then the filtrates were collected through centrifuging and filtering the medium. The ileum ligation tests were done with rabbits and mice by injecting the filtrates and stomach clysis test was done with young mice aged at 1 - 3 days old by infusing the
filtratesd. The results indicated that all three strains of enterotoxigenic E. coli produced toxic agents which may be the reason leading diarrhea and subsequent death of yaks.

All rights reserved. Document No. P02101.0900.

10. Development of Inactivated Vaccine for Enterotoxigenic E. Coli (ETEC) and its Immunity (4-9 Sep 2000)
Q. Zeng1, B. Zhang2, M. Cheng2 and W. Cui2
1Department of Animal Science and Veterinary Medicine, Tibetan Agriculture and Animal Husbandry College, Linzhi 860000, China. E-mail: xzzwl@sina.com
2College of Animal Veterinary Medicine, China Agricultural University, Beijing 100094, China.

Three inactivated vaccines for Enterotoxigenic E. coli (ETEC) was developed with treatments of Al(OH)3, oil-adsorption and bee mucus and their effects were tested. The results showed that the titer was the highest at 7 days after immunization (2') for the bee mucus treated vaccine and then the oil treated vaccine given the highest titer of 2^-10 but later than 7 days. At 29 days after immunization, the vaccination could develop full protection against the challenge of ETEC but the control rabbits died all. This indicated that three kind of inactivated vaccines for ETEC could prevent the rabbits from the challenge of ETEC.

All rights reserved. Document No. P02102.0900.

11. Diagnosis of Enterotoxigenic E. coli in Yaks (4-9 Sep 2000)
Q. Zeng, G. Cha, T. Denba, Z. So and D. Pan
Department of Animal Science and Veterinary Medicine, Tibetan Agriculture and Animal Husbandry College, Linzhi 860000, China. E-mail: xzzwl@sina.com

Three strains of 9901, 9903 and 9904 of bacteria showing very similar epidemiological, clinical, pathological and bacteriological features with that of the E. coli were isolated from dead yaks in Naqu of Tibet, China. Further investigations of morphology, biochemistry, pathological challenge to rabbits, enterotoxicity and serum identification of those strains confirmed that they were enterotoxigenic E. coli which saved as the base for the control of the disease.

All rights reserved. Document No. P02103.0900.

12. The Contribution of Community Animal Health Worker's (CAHW's) to an Efficient Animal Health Management System (4-9 Sep 2000)
P. Horber
Advisor, Veterinarians without Borders, Switzerland/Swiss Tropical Institute, Riedweg 8, CH-3012 Bern, Switzerland. E-mail: Atelier.pe@bluewin.ch

In winter 1998 many herdsmen in the Yushu Tibetan Autonomous Prefecture, Qinghai Province, of China lost a big part of their animals (yaks, sheep) due to heavy snow disaster and extreme low temperature. The 4-set program of the Chinese Government (houses for families, animal sheds, fencing of pasture ground and improvement of grassland) is an important step to prevent future winter disasters. It might also be interesting to reinforce the existing animal health management system. Healthy animals will have a higher productivity and do support better the rough climatic conditions in the high altitude area. Special attention has to be given to the strengthening of the activities of the Community Animal Health Workers (CAHW's).

All rights reserved. Document No. P02104.0900.

All rights reserved. This document is available on-line at www.ivis.org. Document No. P0206.0900.