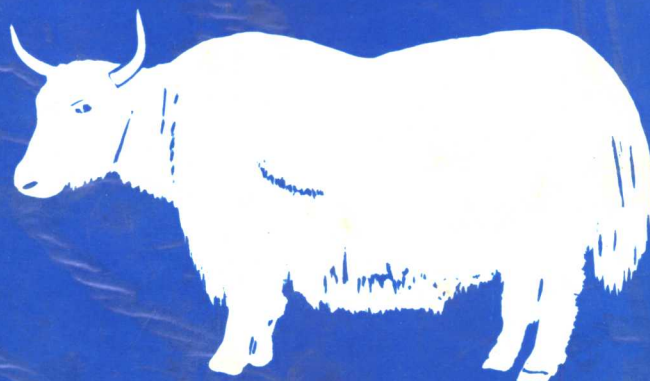


YAK PRODUCTION IN CENTRAL ASIAN HIGHLANDS

Proceedings of the Second International Congress on Yak



September 1~6, 1997. Xining, P. R. China

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YAK PRODUCTION IN CENTRAL ASIAN HIGHLANDS

Advised by
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PREFACE

The principal goals of the Second International Congress on Yak (Ⅱ ICY) are to bring together sophisticated scientists working on yak industry to exchange current research progress and new ideas, and to provide an intimate atmosphere for incubation of new relationship among scientists and create scientific program of trasnational collaboration.

This proceedings provides a compilation of the papers and posters presented at the Ⅱ ICY held in Xining, China during September 1~6, 1997. Eighty three papers are organized in seven sessions dealing with various aspects in yak production. These sessions include: 1) Production System, 2) Genetics and Breeding, 3) Nutrition and Feeding, 4) Reproduction, 5) Draught Power and Environmental Physiology, 6) Basic Health Service and 7) Others. Each session begins with a main report reviewing the most important work in the respective areas or summarizing the contributor's resesrch work in the past few years. We hope these papers compiled will be useful to scientists, extension workers and others concerning yak production and development in central Asian highlands.

After some hard work, the proceedings is ready to release for the Congress. However, the editors did not ask all authors to revise their manuscripts due to the limitation of time and faculties. A few papers were accepted originally except that the format of the papers has been rearranged to a standard form.

We would like to express our sincere thanks to all sponsors, speakers, paper contributors and participants for making the Ⅱ ICY a great success both in science and society. We also wish to acknowledge the financial support of the Congress by the organizations both in China and Overseas.

Yang Rongzhen

Han Xingtai

Luo Xiaolin

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SESSION I :
PRODUCTION SYSTEM

YAK (*POEPHAGUS GRUNNIENS L*) RESEARCH AND DEVELOPMENT IN INDIA

R. N. Pal

National Research Center on Yak (ICAR), Dirang 790 101.
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SUMMARY

The paper deals with the problems that are confronted by the yak herdsman in the Indian States. Problems on breeding, grazing and feeding, diseases, reproduction, product technology have been presented with simultaneous suggestions to solve them. Actions with some immediate measures have also been suggested.

Keywords: yak husbandry, diseases of yak, improvement of Indian yaks

Yak, has been receiving its due international attention, since the days of First International Congress in 1994. Like other yak rearing countries, India's Premier Agricultural Research Organization, the Indian Council of Agricultural Research, through its institute, the National research Center on yak was spear heading the research on the different aspects of yak rearing. The research programs carried out before 1994 had been reported in the first proceeding of the Congress. This paper elucidates the work carried out in the last three years and also the problems suggestions.

Some very important facts and figures had come out in researching on the different aspects of yak rearing in and around the yak tracts of Arunachal Pradesh. It was presumed that almost similar problems were also existing in the other yak rearing tracts of the Indian states of Jammu & Kashmir, Uttar Pradesh, Himachal Pradesh and Sikkim.

Breeding: It is well accepted and taken for granted that the entire economy of the highlanders living on and above 2 500 mt, above m. s. l is predominantly governed by the practice of animal husbandry. The animal components are basically sheep, goat and yak. Sheep and goat are reared separately under traditional migratory system in area between foot to mid hills. Conversely, yak herders in India prefer to tend yaks only. They even do not go for horses as it is practiced in other countries like Mongolia and China. Though yak husbandry is a migratory one, but it is confined only in area between mid hills (2 500 m. s. l.) to high hills (5 000 m. s. l.). The highlanders on the whole, could be termed as non-committal. They accept the off-springs as they come by natural service. The attentions should be given to the following points, deal with considering the breeding aspects of yak rearing.

(a) Herd structure: The productivity is greatly influenced by herd structure. There is no norms to be follow, which results in the lack of replacement stock and in course of time, the entire herd become unproductive in terms of milk yield. Extensive extension work is essential to bring these facts to the highlanders. Scientists of National Research Center on Yak is envisaging programs in this respect.

(b) Providing better breeding bulls: Each pocket should be provided with good breeding bulls with simultaneous castration of the inbred male. This may be effected by mutual exchange of the male yak bulls from the breeding yak farms.

(c) Introduction and popularization of artificial insemination wherever. Yak frozen semen obtained from China is one of the foremost step taken by this institute. The F₁ male will be made available to the different pockets on exchange with the non-description in bred bulls. Such measures could also be adopted in the other yak rearing countries.

(d) Specific breeding programs based on traits: It is to think whether yaks should be bred

exclusively for specified different traits viz. , milk type, meat type, wool type and draught/pack type or should be left as such with only selective breeding policy. The author feels that the future of the yak husbandry depends on the development of yak breed/types according to the traits, which could be reared for specific purposes.

(e) Cross breeding beyond F₁ should be completely depended on.

Grazing and feeding: The year round yak husbandry can be broadly divided into four phases on the basis of available grazing facilities in the Indian yak rearing tracts.

Phase I : Post winter transit period to alpine pasture and the first month of stay in the alpine pasture, during this stage maximum milk yield is achieved due to availability of grasses on the transit route and also on the alpine pasture.

Phase II : Stay in the alpine pasture up to pre-winter when the availability of grasses decline appreciably. The animals productivity in terms of growth and milk yield do not increase but almost remain stable. The climate is most favorable to yak as well as to the herdsman.

Phase III : Pre-winter transit period to mid altitude and available of grasses that grew in summer and remained ungrazed. The period almost continued for a month or so after the arrival. During this phase also the productivity increases due to availability of good grasses.

Phase IV : Peak winter period, when very little grazing is available. The yaks lose a substantial percentage of body weight and decrease in milk yield. If the winter is severe, the herdsman stop milking and allow the calf to suckle.

Phase I and III are golden period of yak husbandry during which no supplementation (except salt lick and mineral mixture) is essential. Phase II is comparatively better than phase IV, the later one could be termed as "Taxing Phase", and there is little grazing is available. Maximum research support is required to counteract the adverse effect during the IVth phase and the suggestive measures are:

(a) Conservational practices of fodder during the summer when grasses are in plenty should be given due consideration. Silage, hays and coarse rough ages (dried post harvest maize plant, small millets & straws) enriched by ammonification and urea treatment should be the major important measures to augment the feeding resources for the winter season.

(b) During phase II supplementation of salt and mineral mixture should be practiced besides measures to improve the pasture land. Some work in this aspect has been found to be fruitful. Grasses like *Dactyloctenium aegyptium* Var *Amba*, *Sparta*, *Porto* had been proved good for high altitude. Aforestation of waste lands at mid-altitude with *Salix humboldtiana* and *S. baboiciana* has given very encouraging results whose leaves are relished by yaks. The added advantage will be regeneration of the damaged environment.

Diseases: The general belief that yaks are very hardy bovid, under increment climate and rarefield air, its hardiness has nothing to do with the incidences of diseases. This is why the author feels the migration system coupled with the stay in alpine pasture partly ward-off the yaks from the bad spell of systemic, gastrointestinal parasites and ecto parasites but does not go without any mortality in the herd. The winter season reduces its vitality substantially to make it prone to fall sick in the late winter periods of February and March.

(a) Blood protozoal diseases viz. , *Babesia Thileria* which are transmitted through ticks, occasionally erupt when the health condition of the yaks are poor. Ticks and other lice are generally shed-off during the transit to alpine pasture. On return trip yaks pick up the parasites and also from the winter pasture. Intensive rearing is presently practiced in the NRC yak Farm, the incidences are present round the year due to the presence of thick and long hairs, the accidents are not effective.

(b) Outbreaks of foot and mouth during the last phase of the winter is maximum besides other systematic diseases. Prophylactic vaccination of the yaks will ward off the incidences as it has happened with the yaks in the adjoining pockets of the yak farm. Mass vaccination program should be under taken well in advance.

(c) Calf mortality due to pneumonia and calf scour and *Ascaris* is maximum during this period which adversely effect the building of the replacement stock and also contribute to irrational herd structure.

(d) Mortality due to phytotoxin also accounts. Scarcity of fodder during the winter, forced the yaks to consume some of the toxic plants/weeds and succumb. Incidentally, with the degradation of the pasture, the weeds are becoming dominant and may pose a major problem if not deal right away. One such poisonous weed is the *Senecio* sp., which has caused a concern in Bhutan earlier and also presently is a major concern in NRC Yak farm.

Reproduction: Yaks under the existing management conditions breed once in two years though some of the yaks are annual breeder. Delayed sexual maturity (4 years & above), long postpartum period, seasonality in breeding habits, presence of abortion agents (*Brucella*, IBR) are some of the reproductive problems confronted in the yak husbandry. Yaks attain the reproductive phase at 4.5 years while the Zebu attains it 3.5 years and the European cattle at less than 2 years.

(a) Reduction in the sexual maturity age has been achieved in the other bovids by selective breeding. It is reported that besides genetic make up, inadequate nutrition, deficiency and imbalance of minerals contribute delay maturity, which indicating that sexual maturity could be reduced. The author feels that once the winter feeding is addressed properly, many of the existing problems could be automatically overcome. The long winter with scanty feeding resources put the yaks in a maximum of physiological stress which put other systems off the gear.

(b) Control of reproductive diseases (viz., abortion) could be easily tackled by mass vaccination and other prophylactic measures.

The product technology: Product technology in the field of yak husbandry has remained in the oblivion from time immemorial in the yak rearing states of India. No innovative measures has reached them due to inaccessible nature of the yak territory and all their trading remained confined within the barter system in the same pockets which open very little opportunities for improvements.

(a) Whole yak milk is a source of very high quality material. It produces high quality butter. The virtues of yak milk butter has not been adequately studied. Due to its high content of short chain fatty acids, it could be correlated with the low incidences of heart ailments as it is presumed to be with the highlanders. Its demand in the world market shall be stupendous even at an exorbitant price if it could be proved its harmlessness with heart ailments.

(b) Churpi (wet yak milk cheese) manufactured by conventional method and subsequent preservation in untanned skin bags has helped in building up different types of bacterial population imparting different hue and odor to the product, unacceptable to the consumers outside the yak herders community. A proper technology is required to be developed and popularized through out the yak rearing countries as it has been done in Nepal.

(c) Yak undercoat, a luxury fiber till now has not received due attention and is used in the home as such. So, also in the case with the skin.

(d) Meat and meat products. A grape vine for the yak herdsman, have remained unexplored not only in India but also among the other yak rearing countries. Processed yak meat and its products shall find a world market for its quality, less marbling, tenderness and good flavor.

(e) Except Nepal, yak as pack do not get much attention in tourism. Tourism spot in the high hills do not open to vehicular traffic, if developed, yak could be utilized to reach those spots. This shall provide additional income to the yak herdsman.

Keeping in mind the above problems, National Research Center on Yak has embarked on the following broad projects in its perspective Plan to work on in the next 20 years.