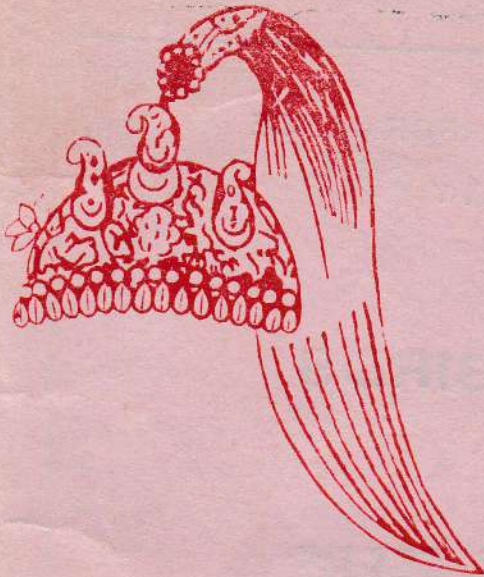


Vol 4.
1975



**CORONATION
ISSUE**

**BULLETIN OF VETERINARY SCIENCE
AND
ANIMAL HUSBANDRY
NEPAL**

**(Official organ of Nepal
Veterinary Association)
(Estd 1967)**



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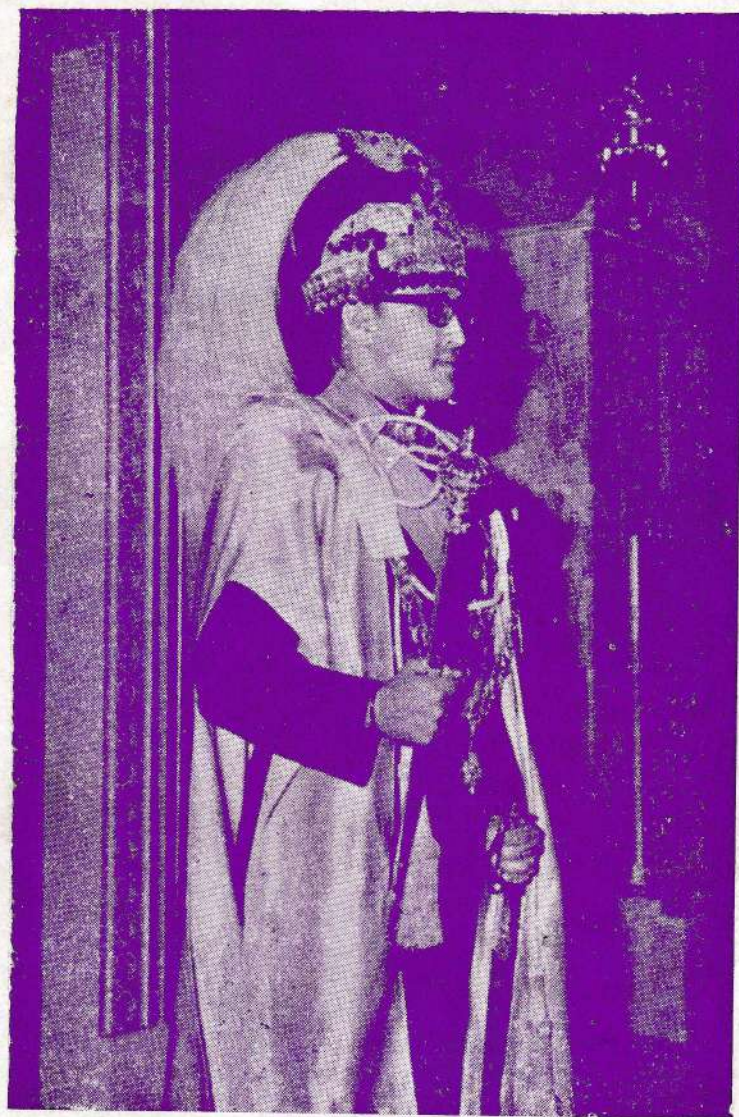
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*The Auspicious Coronation of
His Majesty King
Birendra Bir Bikram Shah Dev*

श्री ५ महाराजाधिराज वीरेन्द्र वीर विक्रम शाहदेव सरकारका जुनाफमा

अभिनन्दन-पत्र

श्री ५ महाराजाधिराज वीरेन्द्र वीर विक्रम शाहदेव सरकारको शुभ राज्याभिषेक महान् राष्ट्रिय पर्वको रूपमा हामी नेपाल भेटेरीनरी परिवारका सबै सदस्यहरू हर्षोल्लासका साथ मनाउँदै छौं । नेपाली जनतालाई विकासको मूल फुटाउने आह्वान गरिबक्सी देशलाई गतिशील नेतृत्व प्रदान गरिबक्सने अपना प्यारा राजाको शुभ राज्याभिषेकलाई यसरी महान् राष्ट्रिय पर्वको रूपमा मनाउन पाउँदा कुन नेपालीलाई अपार खुशी नहोला ?

श्री ५ महाराजाधिराज सरकारबाट प्रत्येक नेपालीलाई, आ-आफ्नो क्षेत्रबाट देशका लागि केही गरूँ भन्ने प्रेरणा बक्सनुका साथै त्यस प्रेरणालाई कार्यक्षेत्रमा प्रयोग गरी विकास कार्यमा संलग्न हुनु आजको मुख्य आवश्यकता हो भन्ने उद्बोधन बक्सी यही आवश्यकताको परिपूर्तिको लागि आह्वान गरिबक्सेको छ । यही कुरा मनन गरी नेपाल भेटेरीनरी एसोसिएशन देशको पशु-धनको सुरक्षा र त्यसको विकास गर्ने दिशा तर्फ कार्यरत छ ।

नेपालको आर्थिक विकासक्रममा कृषि क्षेत्रको महत्त्व सर्वोपरि छ । “हाम्रो देशको आधार नै कृषि हो कृषि-उत्पत्तिमा नै नेपालको उत्थान निर्भर गर्दछ” भनी हुकुम बक्सने स्व. श्री ५ महेन्द्रको सदिच्छा पूरा गर्ने हाल श्री ५ वीरेन्द्रबाट बक्सेको सन्देशमा हुकुम भएको छ- “उच्च पहाडी क्षेत्रमा दूध र पशु विकास गरौं, पहाडहरूलाई फलफूलका रूख-बिरुवाले घेरोँ र समतल फाँटलाई खाद्यान्नको हरियालीले भरौं ।” आजको यस पुनीत अवसरमा श्री ५ महाराजाधिराज सरकारको सदिच्छा साकार पार्ने हामी सुदृढ प्रण गर्दछौं ।

नेपाल भेटेरीनरी एसोसिएशन परिवार मौसूफ सरकारको चिरायुको कामना गर्दै मौसूफ सरकारमा भक्तिपूर्वक हार्दिक अभिनन्दन-पत्र चढाउँदछ । सरकार ! जो हुकुम ।

मिति:- २०३१।११।१२

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सचिव

नेपाल भेटेरीनरी एसोसिएशन

Some Observations On The Incidence of Fascioliasis In Yak and Hilly Cattle

D. D. Joshi* and H. C. Tewari**

Central Veterinary Laboratory,
Tripureswar, Kathmandu, Nepal

INTRODUCTION

Although fascioliasis is prevalent in Nepal since long time, it is only recently that some comprehensive data on its prevalence, distribution and epidemiology have become available (SATA, 1973). These surveys were mainly carried out in sheep, goats and cattle. The results of these localized surveys pointed to the need for a more comprehensive investigation of fascioliasis in the country as a whole. No study

has previously been made to ascertain the importance of helminth parasites in yak and other hilly cattles, which are also of considerable economic importance.

A preliminary survey was recently carried out in Tibrikot District, at an altitude of 9,500 to 24,000 feet above the sea level, which is situated in the remote northwestern alpine region of the country.

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MATERIALS AND METHODS

Faecal samples were collected from different areas early in the morning in accordance with standard practice. The samples were examined for the liver-fluke eggs by the sedimentation and decanting technique (Boray, 1959). The various breeds of animals examined were yak, chowri,

falang, lulu zhopa, tolbu and hilly cattle. Both young and adult animals were included in this survey.

RESULTS

The results of the faecal examination in different groups of animals are tabulated in Table 1.

Table 1: Incidence of fascioliasis in yak and other hilly cattle.

S. No.	Types of animals	Number of animals examined	Number of animals positive	E. P. G. (range)	Percentage of infection
1	Yak	15	5	100-300	33.33
2	Chowri	45	20	100-200	44.4
3	Falang	25	10	100-400	40.00
4	Lulu Zhopa	30	20	100-600	66.66
5	Tolbu	15	5	100-200	33.33
6	Hilly cattle	250	120	100-200	48.00
Total		380	180	100-600	47.36

A total of 380 animals were examined out of which 180 animals were found positive for liver-fluke infection with an overall incidence of 47.36 per cent. The eggs per gramme of faeces varied from 100 to 600. The highest infection rate of

66.66 per cent was found in Lulu zhopa, while the lowest infection of 33.33 per cent was in Yak and Tolbu.

DISCUSSION & CONCLUSIONS

Although only a limited number

of faecal samples were examined in this survey, some useful information on the incidence of fascioliasis has been obtained. The incidence of this disease appears to be quite high in this area, though the e. p. g. counts were low. In this connection Muller (1961) states that egg counts may vary considerably from day to day and Roberts (1957) have shown that high egg counts do indicate heavy worm burden but a low egg count does not necessarily mean a light worm burden.

No Lymneid snails could be found in these areas and as such it was thought likely that these animals were infected during their migration to lower altitudes in winter months and carried the infection with them (SATA, 1973). The pastures at lower altitudes of about 7,000 feet are quite suitable for the growth and survival of the snail host, Lymnaea auricularia var rufescens.

An interesting feature regarding the epidemiology of this disease was the

relatively higher prevalence rate of infection in animals of 12 months of age and over. This possibly showed that some of the young animals included in the survey were not exposed to infection.

A clear understanding of the epidemiology of Fasciola sp. in the area would probably require a more careful study and the repetition of observations at different times of the year.

ACKNOWLEDGMENTS

Thanks are due to Shri D. P. Mahtara, Chairman, District Panchayat, Tibrikot and also to Shri H. R. Shrestha, Farm Manager, Karnali, Sheep Farm, for their cooperation and assistance during the course of these investigations. We are also grateful to Shri P. J. Rana, Deputy Director General, Animal Sciences, Department of Agriculture and to Dr. S. Pyakural, Chief, Veterinary Division, for providing the necessary facilities.

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Feeding High Lysine Maize to Pigs

by

B. D. Shrestha 1

H. B. Thapa 2

J. L. Splitter 3

INTRODUCTION

In most of the developing countries especially in Asia, the diet of the general population is mainly the products of cereal grains. Cereal grains in general contain protein that is imbalanced in certain essential amino acids, lysine being one of the most limiting amino acids. The opaque 2 maize contains nearly double the amount of lysine than in the normal maize (normal maize-2g lysine per 100g protein, opaque-2-3.6g lysine per 100g protein). To alleviate the malnutrition, especially the pro-

tein deficient diet, opaque-2 provides the better quality of protein thereby reducing the expensive items such as animal protein to the maximum extent. By feeding opaque 2 maize in swine, the other components such as meat meal, fish meal and etc can be reduced while compounding balanced feed ration economically.

The main objective of the experiment conducted in village level with the farmers is to introduce the opaque-2 maize to the local farmers and familiarize the farmers with its better nutritive value which was previously unknown to them.

1 Project Manager Cattle Feed Plant, Hetauda

3 Field Technician (Maize) " "

2 Food Bio Chemist USAID Nepal

The improved nutritive value of opaque-2 maize is as effective in improving the growth of children and adults as in animals. However, the pig is used to demonstrate the nutritional value of opaque maize because pigs are grown and fed by many farmers in Nepal.

MATERIALS AND METHODS

Animals and diets: Eight Landrace x Yorkshire Crossbred pigs, aged about 90 days and weighing between 17.5 to 27 kg. were used. High Lysine maize received

from National Maize Development Center, Rampur and locally purchased normal maize both supplemented with major and minor trace minerals and vitamin supplements after mixing thoroughly were ground and fed ad libitum. For this vitamix M with trace mineral supplement and bone meal were given. Both feeds (i. e. high lysine maize and local normal maize) were prepared and stored in a cool dry place throughout the experimental period. The composition of the diet was given in Table 1.

Table 1
Composition of Diets

Ingredients	Treatments	
	1	2
	8% protein Opaque 2	8% protein Normal Maize
Normal maize	% —	% 97.75
High Lysine maize	97.75	—
Bone meal	2	2
Vitamix M*	0.250	0.250

* Vitamix M (Pfizer Pvt Ltd.) as vitamin and trace mineral supplements supplied following nutrients per kg. of diet: 8000 I. U. Vitamin A, 1200 I. U. Vit. D3, 10 mg Vit. B2, 55 mg Manganese, 20 mg Iron, 1 mg Zinc, 0.2 mg Cobalt and 2 mg copper.

Table II
Body weight gain & feed consumption by pigs given high lysine and
normal maize diet (82 days)

Description	Treatments	
	1 8% Protein Opaque-2	2 8% Protein Normal Maize
Initial body wt. in kilogramme	27	20
Group A. Male	27	20
Female	27	27
Group B. Male	20	17.5
Female	21.5	23.0
Average	23.87	21.87
Final body weight in kg.		
Group A. Male	46.0	24.0
Female	48.0	32.0
Group B. Male	37.0	23.0
Female	43.0	28.0
Average final weight	43.5	26.75
Average body wt. gain	19.6	4.88
Average daily wt. gain	0.239	0.0566
Average feed consumed	168.64	113.02
Average daily feed intake	2.008	1.379
Feed/gain	8.60	24.3

Experimental Procedure:

The experiment was conducted in the village condition at the farmer's site in order to show beneficial effect of high lysine maize to the local farmers (as a demonstration trial also).

The animals were randomly grouped into two with both sexes in each group in duplicate and allocated at random to one of the two dietary treatments until the termination of the experiment. The animals were fed thrice daily and the total feed consumption was recorded. Fresh water was provided all the time. The animals were weighed at beginning and end of the experiment. There was no feed residue being collected i. e. offered to the animals again.

RESULTS

Health of the animals:

The pigs remained in good health throughout the experimental period. There was distinct differences between the treated groups with shining and smooth hair coat and alert appearance in high lysine diet fed pigs whereas in local normal maize fed pigs the hair coat was rough and dull. Both groups were active.

Appetite:

Intakes of diet by the high lysine

treated group was from 1.5 kg/day at the start of the experiment and increased up to 2.32 kg/day. The feed consumption of the pig treated with high lysine maize was increased gradually whereas in the local normal maize diet, the pigs appetite was slightly increased from 1.38 kg/day to 1.50 kg/day for about four weeks. After this period the appetite was reduced to the same level till the termination of the experiment. The feed consumption was highly significant different for the two treatments ($P < 0.01$). The consumption of normal maize by the pigs was significantly less than the pigs fed with opaque-2 maize. The similar observation was noted by Pickett at Purdue University and also by Joshi and Splitter in similar studies.

Growth:

The average total weight gain was 19.6 and 4.88 kg in eighty two days for high lysine diet and normal maize diet pigs respectively. The difference was very highly statistically significant ($P < 0.01$).

The feed efficiency was significantly lower ($P < 0.01$) in the normal maize diet. (Table II). The consumption of feed per unit gain was 8.6 and 24.3 in high lysine and local normal maize respectively. The maize with high lysine content, lysine being

the limiting amino acid in local maize, gave better nitrogen with increased growth rate and comparatively more complete utilization of the nutrients present in the diet by the pigs. The feed per unit gain ration is higher in this farmer's study than observed in the closely controlled experiments. This is to be expected as the actual amount consumed was not recorded, only the amount supplied each day. However, the values indicate the differences observed visually.

One Farmers Field Day was organized by the Dist. Ag. Development Office, Makwanpur to show the high lysine maize fed pigs and normal maize fed pigs. Very selective pig growing farmers (20) from 8 different Panchayats were invited and participated in the Farmers Field Day. The farmers were highly impressed with high lysine maize fed pigs, which resulted in a demand of 1 MT high lysine maize seed for next planting season in Makwanpur District.

Conclusion

The opaque-2 maize was much

more superior to normal maize in growth and feed efficiency of the pigs. Being one of the most limiting Amino Acid i. e. lysine in cereal grains, the opaque-2 maize can be incorporated in the diet thereby reducing the other expensive animal protein to the minimum level like meat, fish products etc to make a balanced feed much more economical. Opaque-2 maize not only produces better growth in pigs but will do the same in other animals such as poultry and also in children and adults.

Acknowledgements

The authors wish to thank Dr. M. Splitter for valuable advice and to Mr. G. R. Rajbhandari for providing opaque-2 maize and Mr. K. N. Gangol for arranging farmers tour and other extension activities to introduce opaque-2 maize to the local farmers. We are highly grateful to the progressive farmers Mr. S. M. Gurung and Mr. M. Panth for care of the pigs and also cooperating throughout the experiment period.



Serological Evidence of MYCOPLASMA GALISEPTICUM Infection in Poultry in Nepal.

by

U. Singh, ¹ P. N. Sharma ² and D. D. Joshi ³

Introduction

Chronic respiratory disease of poultry is wide spread and probably the most serious malady in modern poultry industry. The infection is caused by *mycoplasma gallisepticum* and has been reported from different parts of the world: such as Canada (Fahey *et al*, 1953) Philippines (Quizon, 1958) India (Pathak and Singh, 1961) Japan (Tajima *et al*; 1958) England (Chu, 1958)

Australia (Cottew, 1956). Both young and adult birds are affected by the organism. The disease is characterised by persistent symptoms which include tracheal rales, nasal discharge and coughing. Though the mortality of birds during the period of active symptoms is negligible, the egg production of the flock declines by fifty percent which is also associated with reduced body wt. (Adlakha, 1968). So far no sys-

-
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tematic study of this disease has been carried out in Nepal. Hence attempts were made to find out the evidence of this malady in poultry by serological means (Rapid plate agglutination test).

Material and Methods.

Present study was carried out in the Central Veterinary Hospital Kathmandu from January 1974 to July 1974. Poultry birds brought in the hospital with various complain were used for this trial. Avia PPLO diagnostic antigen indigenously prepared by Indian Veterinary Research Institute was used for the detection of *mycoplasma* antibodies. One ml. of blood was collected from each bird with the help of a sterilised

syringe from wing vein in a clean test tube. These were kept in the refrigerator over night and following morning serum was taken out with a clean pipette. A drop of this serum was put in a square of glass plate and a drop of above antigen was added to it. One drop of plain antigen was kept as control in another square of the plate. Uniform mixing of serum and antigen was made by stirring with a clean stick. Reaction (Appearance of clumps) was read within 3 minutes of adding the antigen. Basing on the reaction, results were noted as positive, suspected and negative.

Results and Discussion

Blood serum of 270 poultry birds

Table showing the results of serological test.

Total no. of serum samples tested	270	Reaction			Percentage of positive cases
		+	±	—	
Group "A" no of birds showing respiratory symptoms	70	30	13	27	42.8
No. of birds with group "B" other sympto	200	55	22	123	27.5

+ = Positive.

± = Suspected.

— = Negative.

were tested during this trial. All these birds were brought in the hospital for the treatment with various complain. Basing on the clinical symptoms all these birds were devided in two groups. In group "A" only the birds with respiratory symptoms were included where as in group "B" birds showing other symptoms were kept. The results are given in the table.

From table it is evident that 30 birds belonging to group "A" with clinical respiratory symptoms (42.8%) gave positive reaction for the presence of *mycoplasma* antibodies which suggested that these birds have been infected with this infection. Besides, 55 birds (27.5%) belonging to group "B" were also found positive for *mycoplasma* antibodies. Lucas and Luthgon (1964) during their study examined 3630 random serum samples and found about 41.5 percent of the birds contained *mycoplasma* agglutinins. Which supports present finding. In similar studies Estola (1967) has also demonstrated

antibodies in 90 poultry flocks by using plate agglutination. From this study it could be concluded that *mycoplasma* infection exists in Nepal and further studies on the isolation characterization of the organism is stressed.

Summary

A serological trial by plate agglutination test was performed in 270 serum samples of poultry. *Mycoplasma* infection was established in Nepal by serological means and further study on the other aspects i. e. isolation and characterization of the organism is stressed.

Acknowledgement

The authors express their thanks to Mr. P. J. Rana, Deputy Director General Aonimal Research, Department of Agriculture and Dr. S. N. Pyakuryal, Head, Veterinary Division for providing facilities for the work.

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Methods for Testing Hygienic Production of Milk

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The keeping quality of milk is entirely dependant upon its cleanliness which in turn depends upon the methods of production and distribution. Clean milk term should rather be applied to milk drawn from healthy cows and handled under hygienic conditions so as to carry very little bacterial contamination. Every effort should be made to avoid the introduction of dirt and dust in any form and to combate the idea that subsequent straining, filtration, refrigeration and heat treatment can be substituted for clean milk production. Milk is a perfect food for man as well as for bacteria. When these organisms attack the

constituents of milk through dirt and dust they produce undesirable chemical changes and production of off-flavours leading to the spoilage of milk as human food.

Dairy farm buildings and installations should be well placed constructed. Ventilation and good lightening are the most important for producing clean milk. Good ventilation also reduces the risk of undesirable odours occuring in milk. Milking sheds should be in welldrained sites, and adequate provision should be made for the frequent removal of manure from the shed and its immediate environment. All the waste feeds, organic wastes and manure should be disppoeed immediately in order to reduce fly

population and as cow dung is source of coifform bacteria which produces acid gas and spoils the quality of milk. The introduction of contaminating particles from dirty udders and teats, from improper handling of the milk or milking utensils, from the persons or clothing of milkers or from air borne dust, may all lead to more rapid souring or spoiling of milk. Dairy cow should be free from diseases. It is very important that milker or milk handling persons should be also healthy and clean, free from diseases. Milking should be done with clean and dry hands. Cow should be washed and clean the udders before milking. All the utensils milking pails, cans should be clean with effective detergents, chemicals, steam, boiling water. Water for dairy farm, cleaning and washing of utensils should be clean and free from any dirt and dust particles. All the milk equipments and utensils, coming in contact with milk from production, processing and transit should be clean and sterilized. They all should be free from dust and dirt particles. Chilling of milk is also very essential in order to keeping long quality. In long distance milk should be sent in ice-chamber cans. Milk should be well pasteurized in required temperature and plants should be clean and free from dust and dirt particles.

For the checking of hygienic pro-

duction of milk, the following tests are widely used in dairy industries:-

1. Alcohol test (68% Alcohol) :

It has shown to be reliable. Alcohol added to an equal volume of milk will be best result found. In this test, if particles of casein adhere to the sides of the tube it indicates the end of keeping quality of milk.

2. Alizarin-Alcohol test (68% alcohol)

This test combines the ph indicator and alcohol test. In this brown red and violet colour indicates sour milk.

3. Clot-on Boiling test : In this

test when boiling the milk in water bath for 10 minutes, if the milk coagulates is the last indication of keeping quality.

4. Ten minutes Resazurin test :

At the end of 10 mts. observe the colour in a comparator and Disc. Nos. 6 and 5 at the end of 10 minutes will indicate normal milk. Sample is incubated at 37°C. temperature.

5. Acidity test: Acidity is deter-

mined by titrating against N/O Na oH using phenolphthalein as indicator. The acidity should not be more than, 0.16 to 0.18% lactic acid.

6. Sediment test: It indicates clean

production of milk. If standard reading

is 0.4 mg. is good and above 0.6 mg. is not acceptable.

7. Indicator strips test: This test also has been used as a rejection test. But not widely used due to expense.

8. M. B. R. and Resazurin Reduction tests. These tests are also used for conducting the hygienic and quality of

milk produced in the farm as well as handled.

Conclusion.— Milk freshly drawn from clean, healthy cows handled under hygienic conditions may show the highest quality and less bacterial count: should be delivered to the consumer. Cleanliness and sanitation is the most important in production of hygienic milk.



Survey on Animal Health and Husbandry along the Road Alignment between Dolakha and Lamosangu*

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Integrated Hill Development Project
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Livestock is a irrevocable necessity in the mixed farming of the hills. Mechanization of agriculture in the hills is difficult and the farmers have to depend on cattle for ploughing. At present manure is the only valuable fertilizer easily available in the region. According to farmers, chemical fertiliser gives best results only if mixed with manure.

Livestock plays a multi-purpose role by providing power, meat, milk, wool, eggs and cash money – the essentials for human living. Thus agricultural development of the region is unconceivable without development of animal husbandry and animal health service.

Lack of communication facilities which has made the villages quite remote

* Permitted for publication by I. H. D. P., 1974.

1 Lalitpur Veterinary Hospital (Present address)

aparting them from centers for necessary and immediate approach.

Lack of hospital and dispensaries has made the villagers to depend on and believe in traditional superstitious actions of "Dhami" and "Jhakri" expecting their miraculous cure on them and their animals. Though the faith in "Dhami" and "Jhakri" is decreasing by the influences of far hospitals, there is no way out to choose better alternatives than their traditional "Tantra" and "Mantra". Local already people know that many of the serious diseases can not be treated well by quacks but they are dependant on the help of "Dhami" and "Jhakri". According to the survey villagers always showed their interest in modern medicines; if they could avail of those facilities they would be very happy.

Liverfluke, Haemorrhagic Septicaemia, Rad water and Food and Mouth Disease are the most common diseases which cause either many losses of livestock or effect the economy of the farmers as a result of diminished animal produces. By these diseases huge quantities of proteins are spoiled and in an indirect sense the invested fodder wasted.

Leeches of different species are causing economic loss in livestock production

and have become a great problem specially in upper hills. Tick infestations in cattle are also conspicuous. (tickvector for red water).

"Ban Mara" a jungle weed causes rising problems. This weed is only grazed by goats which subsequently are affected by gastrointestinal ulcerations and die within 3 months after continuous grazing as the farmers believe.

Most striking to us but on the other hand a natural thing is that farmers offer own mixed feed concentrates to buffaloes according to their milk production.

Reasons for keeping animals:

cow:- manure production, ox, milk; although cows are actually not kept for this purpose it is welcome if a cow yields surplus milk and meat, if a cow dies of oldness or by accident it is given to Tamangs, Sherpas or low caste people for consumption. Cows died of diseases are used as protein fertilizer.

buffalo:- milk if a farmer wants to produce milk meat and manure then he keeps buffaloes.

pig:- meat and manure

goat:- he goats for meat. combined with worshipping and prevention from bad ghosts and diseases.

sheep:- Wool, meat and occasionally for milk.

poultry:- meat, combined with worshipping, eggs and prevention from bad ghosts.

Murrha buffalo bulls and their decendants have left good influence on farmers because some panchayats achieved the breeding facilities of Murrha bulls distributed by Agriculture Development Office. The resulted cross bred buffalo cows are doing better in production than locals.

Recommendations

1. Necessary Surveys

Before implementing livetsock projects in the region surveys about the concerned resources should be done. As in Nepal some valuable breeds exist, first and foremost these national resources should be evaluated. It is not always good to stick to exotic breeds: e. g. they are highly susceptible to diseases and most of the diseases are still not under control in Nepal. At present the animal health service is not in a position to look properly after exotic breeds. Acclimatization is also a problem.

(18)

1.1. In case of cow "Achhami cows" are known to have good pedigree. These cows could be distributed to the farmers of the region because they are supposed to be good milk yielders more disease resistant than exotic breeds, light and small breed easy to rear in hills to produce bulls resp. oxen for draught on small hilly areas, to consume less fodder and concentrates. It is an indigenous breed found in Achham District of Nepal and to have no problem of acclimatization.

2. Proposals

To strengthen a harmonic development in animal health and husbandry the following steps should be undertake by IHDP with its other activities in that region.

Phase I

-to make available basic veterinary drugs to the farmers. Fasciolicides to treat liverfluke; antibiotics to stop HS- outbreaks. These are simple and effective treatments which reduce the dead loss rate. To make available chickens from the hatchery at Dulikhel (4-5 Weeks old, vaccinated) and leech eradication trial programme.

Phase II

- 1- Short training of young local "Dhamis" and "Jhakris" or other young people in the subjects of basic disease - symptoms (temperature, pulse rate), diagnosis of the four most important big ruminant diseases, basic treatments (injections against red water) and medicamentations (antibiotics) and vaccinations (HS). These trainings should be similar to the courses held by HMG at Nepalgunj.
- 2- To procure a secure market for animal products and to make links to the Kathmandu market.
- 3- To establish an animal fair (weekly, monthly, 6-monthly, yearly, according to necessity) in order to upgrade local breeds and introduce improved breeds (Achhami cows, buffaloes, goats). Government Livestock Farms and the region must be linked for animal supply.
- 4- Reintroduction of burwal or equivalent sheep (transhumance type of sheep)

to meet the local wool requirements (Bakhu) and for meat and eventually milk.

- 5- An effective ADB subbranch will be necessary to provide loans (ev. kind loans).
- 6- To make available Hetauda - feed concentrates.
- 7- Introduction of artificial insemination at demonstration level to make farmers conscious and convinced of the advantages of A. I. (stop transmission of sterility causing venereal diseases, controlled breeding). All required material for such a programme is available with the Central Veterinary Laboratory Kathmandu.
- 8- Leech eradication programme if the trial was successful.

Phase

To establish a mobile veterinary dispensary combined with A. I. service and eventually a livestock farm for animal production will be necessary to meet the requirement of animals.



Ethnological Notes on YAK Herding in HUMLA.

D. D. JOSHI

Hill Agriculture Development Project UNDP/FAO/HMG Project and

Nancy Elaiue Levine

Ethnological Research Student from USA in Nepal

The information here was collected in the course of ethnological research and disease investigation work in Karnali Zone from June 1973 to September 1973 and November 1973 to March 1974. Yak and its crossbreeds with hilly cattle are kept in these following villages of Humla district: Dojam, Limatang, Bargaon, Torpa, Bureuse Dinga, Kermi, Tamgin, Yabka, Yanger, Muchu, Tunkot, Yari. Limi gaon (Jama, Hulji and Tir Villages), Jarkholi, Khagal Darma, Tanke and Nepka Villages. This

information was collected mostly in the area of Limi group of villages on brief visits to the Kermi, Yabka and Dinga summer herding camps and in the Bargaon group of villages. The information on terminology was collected entirely with the people of Bargaon. Except where Tibetan words can be offered, it should not be assumed that this terminology used by the Bhoteas of Northwestern Nepal, can also be applied to Tibetan or to other Nepalese Bhotea population.

Terminology

1. Group name Yak (Rominization Gyag)

- a. Male adult **Gal Yak** or **gal yag**
 - b. Female adult **diu**
 - c. Male calf (over the age of one year) * **ye rug**
 - d. Female calf (over the age of one year) * **yar me**
2. Group name **Pa lang** (Rominization **ba glang**)
- a. Male adult **lang**
 - b. Female adult **Pa**
 - c. Male calf **langthug**
 - d. Female calf **yarmo**
- * All calves (of cows, Yak and crossbreed) under one year are called **lug tsi**
3. Crossbreed of Yak and Cow (either Male **gal yag** and Female **Pa** or Male **lang** and Female **diu**) Group name **Pa Oze**
- a. Male adult **Ozo Pho** (**mdzo pho**) (All males are sterile)
 - b. Female adult **dzo mo** (**mdzo mo**)
 - c. Male calf **dzo rug**
 - d. Female calf **dzo rugma**.
4. Crossbreed of **Dzo mo** and Cow bull Group name **Tol** (Rominization **rtol**) (All males are sterile)
- a. Male adult **Tol bo** (**rtol bo**)
 - b. Female adult **Tol mo** (**rtol mo**)
 - c. d. Calves also called by adult names
5. Crossbreed of **Tolmo** and Cow bull Group name **Bak ting**.
- a. Male adult **Bak ting phe** (Males may be sterile this is not certain)
 - b. Female adult **Bak ting mo**
 - c. d. Male and Female calves **Tog ting**
6. Crossbreed of **Bakting mo** and Cow bull Group name **Kog ting**
- a. Male adult **Kog ting pho**

- b. Female adult **Kog ting mo** (Males may be sterile)
 - c. d. Male and female calves (From birth till adulthood) **lug tsi**
- 7. Crossbreed of **Kogting mo** and cow bull (Males may be sterile)
 Group name **Tog ting**
 - a. Male adult **Togting**
 - b. Female adult **Togting**
 - c. d. Male and female calves (From birth till adulthood) **lug tsi** Thereafter all crossbreeds are **Pa lang**
- 8. Crossbreed of **galyag** and **Dzomo** Group name **Dzuna**
 - a. Male adult **Dzuna dzo mo**
 - b. Female adult **Dznua dzo pho**
 - c. d. Male and female calves (From birth till adulthood) **Ing tst**
- 9. Crossbreed **Galyag** and **Tolmo** Group name **Tol dzo**
 - a. Male adult **Tol dzo pho**
 - b. Female adult **Tol dzo mo**
 - c. d. Male and female calves (birth till adulthood) **lug tsi**
- 10. Crossbreed of **Galyag** and **Baktingmo** Group name etc.
 same as No. 3, crossbreed of Yak and Cow
- 11. Crossbreed of **Galyag** and **Kogtingmo**
 Same as No. 3
- 12. Crossbreed of **Galyag** and **Tegtingmo**
 Same as No. 3
- 13. Crossbreed of **Galyag** and **Dzuna dzomo**. No information
- 14 Crossbreed of **Galyag** and **Tol dzo mo** Group name: **dzun**
 - a. Male adult: **dzuna pho**
 - b. Female adult **dzuna mo**

c. d. Male and female calves (birth till adulthood) lug tsi

This is an unsuccessful cross: the offspring die.

15. Crossbreed of Pa lang (Male) and dzuna dzomo Group name Gar dzo

a. Adult male Gardzo pho.

b. Adult female Gardzo mo.

c. d. Male and female calves (birth till adulthood) lug tsi. Unsuccessful cross: offspring die.

16. Crossbreed of Pa lang and tolzomo No. information.

Ethnological notes on Yak herding:

1- All bovines under the age of one year are called lug tsi

2- thug or rug is a morpheme that means child in the Tibetan language.

3- Mo is a morpheme often, though not exclusively, applied to signify female-ness and similarly po or pho signify maleness. Ma and pa or pha also respectively are applied to female and male entities.

4- All crossbreeds are sterile, however it is alleged by some informations that the bakting, kogting and togting are similar to cow and not sterile. That is a question worthy of further investigation. Most people maintain all crossbreed males are sterile.

5- Only one Yak and cow are kept for breeding purposes. The male Yak is

called the phowa, the male cow is called the zolang.

All other males are sterilized (castrated).

6- In Bargaon and nearby villages the most commonly kept coossbreeds are the dzo pho, dzo mo, tol bo and tolmo.

The dzo pho and tolbo are used for plowing the fields, the dzo mo and tolmo give good milk.

7- This tol mo and tol bo are not very sturdy in childhood and many die. This would seem to be the case for all crossbreeds beyond the dzo pho and dzomo which are very sturdy calves.

8- Very few baktingpho, kogting po and togting as well as true pa lang (cow) are kept in these villages. In ordinary lveryday speech, all these animals are identified as palang.

9- Very few yak are kept by the Bargaon group villages. Some years ago there were more Yak than there are today but they seem to have been lost in a series of misfortunes, toppling to their deaths when roads caved in during a monsoon etc. The lack of Yak and large herds in general (the average family has some ten animals) is due to inadequate high altitude herding areas for summer and inadequate grasslands for obtaining hay for winter feeding. Tamgin, Dinga, Kermi, Yabka etc people have larger herds and more Yak also cow cross breeds but they have large open areas to the north. They also keep their animals in the village in winter. Limi people have large herds predominantly Yak: large herding areas are available. They take their animals to Tibet in winter.

Bargaon people buy their dzopho and dzomo from Limi or Tamgin, Dinga etc.

10- Only the Limi people keep their sheep (Bhyanglung sheep) in Tibet for the winter. Other Humla Bhotia populations take their sheep (Berwal & Jumle sheep) to Accham. The Limi sheep have much finer wool than the berwal and Jumle sheep.

11- Cows, Yak and crossbreeds are used for milk production and for meat. Yak and sheep milk is mixed. The dzopho are used in agriculture. Yak, diu, dzopho, dzomo in carrying loads of various sorts. Hides are made into leather. Only the Yak hair is used for blankets, tents, and ropes.



AN EARLY GROWTH RATE IN BARUWAL SHEEP

N. P. Singh Karki

Lumle Agriculture Center

An attempt to study on the growth trend in Baruwal lambs was tried at Lumle Agriculture Center in 1974 from the lambs born from six farm reared ewes. Though, it is too early to draw any conclusion from the result as there was a small population yet it may be useful to be noted as an body weight gain in Baruwal sheep at an stationary management for comparision while making studies in migratory Baruwal sheep. To complete this study, further investigation in lamb born at different seasons is worth considiring to avoid climatic variation and grass effect which could be continued later.

However, the result is in the same trend as stated by Mr. Nanda Prasad Shrestha from Pansaya Khola Sheep in his annual report of 1974.

MATERIALS AND METHODS.

Beside the lavishly fed common salt, no cocentrate feed was given to ewes as well as lambs. Occasional grazing on improved pasture was allowed after lambing. The pasture leys had the mixture of Brown top, Cocks Food and Clover grasses.

Body weight of the lambs were recorded immidiately after birth and then onwards at every first date of the month only. Thus the recording does not give the

exact body weight gain after the completion of age stated as it required weighing the lambs individually according to their date of the birth. The body weight is calculated on the daily average weight gain.

All the male lambs were castrated on 23rd July 1974.

Average live weight of adult sheep was 30.62 Kg.

RESULTS and DISCUSSION:

Table I The recorded live weight gain was as follows:

Lamb No.	Sex	Date of birth	Birth weight KG.	1st May KG.	1st June KG.	July KG.	Augst KG.	Sept. KG.	Oct. KG.	Nov KG.
11	Female	4.4.74	3.65	10.3	16.0	22.5	27.5	28.5	32.0	32.0
12	Male	5.4.74	3.30	8.0	12.0	18.0	22.5	23.0	25.0	27.0
14	"	7.4.74	2.85	9.0	14.0	19.5	23.5	24.0	26.0	27.0
15	Female	12.4.74	3.5	7.2	12.0	17.0	23.5	24.0	27.0	29.0
16	Male	17.4.74	3.85	7.5	14.0	22.0	27.5	28.5	32.0	33.0
17	Female	19.4.74	2.4	5.25	10.0	14.0	20.0	22.5	26.0	28.0

Table II The calculated body weight at different age is as follows:

Lamb No.	Sex	Birth weight KG.	1st month KG.	2nd month KG.	3rd month KG.	4th month KG.	5th KG.	6th KG.
11	Female	3.65	11.035	16.866	23.144	27.628	28.966	32.0
12	Male	3.30	8.645	13.000	19.225	22.580	23.333	25.32
14	"	2.85	10.128	15.281	20.403	23.612	24.466	26.22
15	Female	3.25	8.857	13.999	19.515	23.692	25.200	27.74
16	Male	3.85	11.063	18.532	25.015	28.047	30.482	23.47
17	Female	2.40	9.160	12.532	17.676	21.531	24.715	27.25
AVERAGE		3.216	9.814	15.035	20.829	24.515	26.193	28.15

Table III The calculated daily weight gain in Gramme at different age is:

No.	1st. month	2nd Month	3rd Month	4th Month	5th Month	6th Month	7th Month
11	246	183.8	216.6	161.2	32.2	116.6	constant
12	178	129.0	200.0	145.1	16.1	66.6	64.5
14	242.6	161.2	183.0	129.0	16.1	66.6	32.2
15	186.9	154.6	166.6	209.6	16.1	100.0	64.5
16	240.4	209.6	266.6	177.4	32.2	116.6	32.2
17	225.3	153.2	133.3	193.5	80.6	116.6	64.4
Average	219.8	165.2	194.3	169.3	32.2	97.1	51.5

The above result shows that the Baruwai sheep has very fast grow characteristic in its early age which could be utilise best in mutton production provided the managerial changes needed could be fulfilled. The changes in present migratory management particularly will be required in inducing heat in ewes some where between Nov.-Jan. However, in natural migratory condition according to the study made by Mr. R. M. Odell at Khuldi Sheep Station in 1973-1974, the lambing percentage is seen very high between Nov-Feb.

If more summer lambing could be encouraged, the male lambs could be made available for slaughter while coming down from the high pasture and not required flushings before slaughtering. It

could not only avoid Autumn mortality but also could give more room to feed for female lambs during critical winter period. It could be more economical to the sheep farmer to sell young lambs rather than old wether as there is high mortality caused from low plane of nutrition and diseases. Controlling diseases only would not be effective to reduce the mortality unless feeding condition would improved simultaneously. To improve winter feeding situation could be a long term programme and could not be effective to meet the country's immediate need. The high demand of mutton during Sept./Oct. because of Dashahara festival however could be met from the lambs as suggested as there is low mortality in high pasture.



BULLETIN OF VETERINARY SCIENCE
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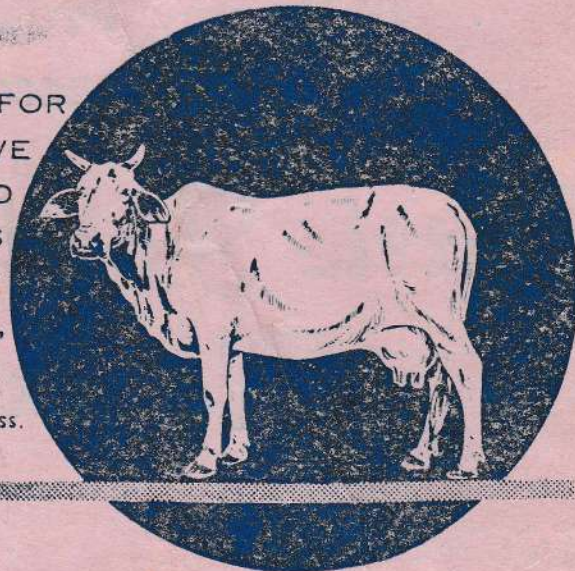


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Printed at: NEW PRINTING PRESS, KATHMANDU, P. N. 13-831