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Proceedings of the Third National Veterinary Conference

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Animal Husbandry

Nepal



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Editorial

Livestock rearing is an integral part of Nepalese Agriculture system. Its contribution in terms of milk, meat, wool, hide, fuel, farm yard manure and farm power is highly significant. It is estimated that contribution of livestock sector in Agricultural GDP is 25 per cent.

It is very unfortunate to say that even to day animal diseases are the main constraints for the development of livestock. Animal devastating diseases like Rinderpest in ruminants, Infectious bursal disease in poultry and swine fever in pigs have been frequently occurring incurring heavy economic loss. Therefore a systemic approach for the control of the disease is a demand of time.

Proper disease diagnosis and investigation are prerequisites for the epidemiological survey and control of the diseases. In Nepal, very few Veterinarians are involved in this area. The trained man power are also not given proper place according to their field of specialisation. Therefore the government has to give due consideration in this aspect.

Among various production parameters like proper utilisation of manpower, animal disease control plan, breeding policy and pasture & fodder management, some preliminary set up of animal disease control system including disease investigation and vaccine production has been started since long. To make the country self sufficient in these basic facilities required for the prevention of the diseases, its further expansion and elaboration is expected from the government.

Breeding policy in the country is very haphazard. Breeding has been considered only as a means of cross breeding of the animals. Most of the exotic and cross breeds are found highly susceptible to the common diseases prevalent in the country. Immunogenetic role of the local breeds has been ignored. The genetic inherent quality of the indigenous breed has to be reviewed.

Due to heavy pressure of animal and human population pasture land and animal feed resources have been reducing day by day. Proper utilisation of agro by-products and maximum utilization of forests by ideal management may reduce this pressure to some extent.

Nepal has the lowest veterinary manpower in the world. It has to depend completely on other countries for the production of veterinary graduates. Animal science graduates produced by the IAAS are not capable to carry all the activities of the livestock development. Therefore, one veterinary institute must be established in the country.

Nepal veterinary association is always in the service of the farmers and the country itself. The association is presenting various suggestions for the solution of the problems encountered in the livestock development program to the government. The suggestions are the outcome of the number of scientific seminars held from time to time and of the scientific panel discussion in the past conferences. Therefore, the association is fully hopeful that the government will consider these suggestions sympathetically and encourage the veterinarians to devote more deeply for the cause of the farmers and professional development particularly in regard to the livestock production whereupon the 95% population of the country are dependent for their livelihood.

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Proceedings of The Third National Conference of Nepal Veterinary Association

Kathmandu

10-12 August 1990

On 10th August 1990 the inaugural ceremony of the Third National Conference of Nepal Veterinary Association was held in APROSC Building, Kathmandu.

Rt. Honourable Prime Minister Sri Krishna Prasad Bhattarai and Honourable Minister for Agriculture and Forestry Sri Jhala Nath Khanal after being received by the president of NVA Dr. D.D. Joshi, were requested to take their respective seats of Chief Guest and Chairman of the ceremony respectively and were presented the programme of the conference by the President of NVA.

Dr. D.D. Joshi, President of NVA presented the welcome address (Appendix I).

The conference was inaugurated by the Chief Guest, Rt. Honourable Prime Minister Sri Krishna Prasad Bhattarai by lighting the ceremonial lamp as well as opening the banner. He addressed the conference (Appendix II) mentioning the important role of Veterinarians in the development of livestock production by curing and preventing the most common diseases of animals and poultry. He also mentioned the religious, social, cultural and economic values of a cow in Nepal.

Dr. S.P. Gautam, General Secretary of the NVA presented the objective of the conference and also about different activities of NVA (Appendix III).

On behalf of the NVA, President offered the gifts to the chief guest as well as Chairman of the inaugural ceremony.

Chairman, Honourable Minister Sri Jhala Nath Khanal addressed the ceremony by mentioning the importance of trained manpower in the field of milk, meat and egg production in the country and wished all success of the conference (Appendix IV).

Lastly Dr. Bhola M. Shrestha presented the vote of thanks (Appendix V).

The closing ceremony was addressed by Mr. A.N. Rana, Secretary, Ministry of Agriculture (Appendix VI) and Dr. U. Mishra presented vote of thanks.

The recommendation made were presented by Dr. S. P. Gautam (Appendix VII).

3rd National Conference of Nepal Veterinary Association

10-12 August, 1990, Kathmandu

P R O G R A M M E S

INAUGURAL CEREMONY

10-8-1990 (26-4-047); 8:30 AM

1. Presentation of the programme to the Honourable Guests.
2. Welcome address by the president of the Association Dr. D.D. Joshi.
3. Inauguration of the conference, release of special conference issue of Bulletin of NVA and inaugural address by the Chief Guest Rt. Hon. Prime Minister Krishna Prasad Bhattarai.
4. Presentation of gift to Honourable Guests by President of NVA.
5. Objective of the conference by Secretary: Dr. S.P. Gautam.
6. Chairman's Remark by Hon. Minister for Agri. Jhala Nath Khanal.
7. Vote of thanks by Dr. Bhola M. Shrestha.

Refreshment

TECHNICAL SESSION-I

Morning Session

Chairman: Dr. U. Singh

Rapporteurs: Dr. M.S. Karki, Dr. B. Joshi and Dr. B.K. Khatiwoda

11.00-11.30 Studies on the eradication of sarcoptic mange from a herd of pig by period of intensive treatment

Dr. Prabesh M.S. Pradhan

11.30-11.40 Discussion
Effect of season and stage of lactation on milk lactose and Chloride contents in Murrah Buffalo.
Dr. I.P. Dhakal IAAS.

12.10-12.20 Discussion.

TECHNICAL SESSION II

Afternoon Session:

- Chairman Dr. M. N. Pande
Rapporteurs: Dr. P. Pathak, Dr. B. R. Thapa, Dr. S. B. Malla
- 1:10-1:40 The role and relevance of veterinary expert in the tribunals of Nepal
Dr. S. R. Bhandari
- 1:40-1:50 Discussion
- 1:50-2:20 Fibrosarcoma in Himalayan Musk Deer (*Moschus Chrysogaster*)
Dr. B. Thapa
- 2:20-2:30 Discussion
- 2:30-3:00 Role of DANIDA in Developing DDC in Nepal
Dr. D.D. Joshi & Mr. O. Jepson
- 3:00-3:10 Discussion
- 3:10-3:40 Tea
- 3:40-4:10 Slide talk — Veterinarian's in Environmental Conservation
Dr. Mukti Shrestha
- 4:10-4:20 Discussion
- 4:20-5:00 Poultry paper

Dinner at Veterinary Complex

TECHNICAL SESSION III

11.8.1990 (27.4.047)

Morning Session:

- Chairman: Dr. S.N. Pyakuryal
Rapporteurs: Dr. P. Sapkota, Dr. B. Parajuli and Dr. D. Sedai
- 10:10-10:40 Street food and dairy products a source of food & income in Kathmandu.
Dr. D.D. Joshi & Dr. P.R. Bista.
- 10:40-10:50 Discussion
- 10:50-11:20 Efficacy of Triclabendazole (Fasinex) against chronic Fascioliasis in buffaloes.
Dr. B.R. Joshi
- 11:20-11:30 Discussion
- 11:30-12:00 Epidemiological studies of Foot and Mouth disease outbreak in an organized farm.
Dr. R.M. Shrestha & Dr. S.B. Malla.
- 12:00-12:10 Discussion
- 12:10-12:40 TEA

TECHNICAL SESSION IV

Afternoon Session

- Chairman: Dr. T.B. Basnet
Rapporteurs: Dr. T. Subba, Dr. Karuna Sharma and Dr. D.R. Adhikari
12:40-1:10 Effect of economical concentrate feed in milk production. Dr. P. Mainali
1:50-1:20 Discussion
1:20-1:50 Preliminary study of Khari disease of Buffalo in Baitadi and Darchula districts. Dr. D.R. Ratala, Dr. P. Manandhar, and Dr. G.R. Pant
1:50-2:00 Discussion
2:00-2:15 Artificial Induction of lactation in cow. Dr. Y.P. Yadav
2:15-2:25 Discussion.
2:25-3:00 **COMMERCIAL SESSION I**
3:00-3:30 Tea
3:30-5:00 Over all group discussion
Preparing consolidated report

Dinner at Blue Star Hotel

CLOSING CEREMONY

12.8.1990 (28.4.047) 10:00-12:00 Noon

1. Presentation of consolidate report by Dr. S.P. Gautam.
2. Closing remarks by the Chief Guest.
3. Chairman's remark.
4. Vote of thanks by Dr. U. Mishra.

Refreshment

- 1:00-3:00 **COMMERCIAL SESSION II**
3:00-3:15 Tea

General Body Meeting of NVA

Dinner at Nanglo

THE THIRD NATIONAL VETERINARY CONFERENCE

10-12 Aug, 1990, Kathmandu



Rt. Hon. Prime Minister
Shri K.P. Bhattarai entering
into the Conference Venue

Expression of honour (1
minute silence) to all the
Martyrs of Peoples
Movement



Welcome address
by the President of NVA
Dr. D.D. Joshi

THE THIRD NATIONAL VETERINARY CONFERENCE

10-12 August, 1990, Kathmandu



Rt. Hon. Prime Minister
Shri K.P. Bhattarai releasing
the special issue of NVA
Bulletin as 17-18

Hon. Minister for Agriculture
Forest & Land Reform Shri
J.N. Khanal delivering
Chairman's Remarks.



Participants of the
Conference with the
distinguished guests.

STUDIES ON THE ERADICATION OF SARCOPTIC MANGE FROM A HERD OF PIGS BY A SHORT PERIOD OF INTENSIVE TREATMENT

P.M.S. Pradhan *

Introduction

Scabies eradication is very difficult because mites live deep in the epidermis, where most of the medicaments can not penetrate. Continued treatment is essential to control mange in pigs.

The purpose of this study is to try to eradicate mange by a short period of intensive treatment thereby avoid the necessity of spending time and money on continued treatment of sows before farrowing.

The application of conventional treatment, results in apparent improvement but the problem of deepseated infestation usually remains. The 20% phosmet** is an organophosphorous compound, in a base of organic acid is easy to apply and effective in penetrating the epidermis and kills the mites. Kripling and Westlake (1966, cited by Magee, 1974) reported that the organophosphorous insecticides are much less stable than the organochlorides and are usually changed quite rapidly to non-toxic compounds by chemical or enzymatic reactions, both inside and outside the animal's body. Many of the metabolites and some of the parent compounds are more soluble in water than in fats and are excreted quite rapidly after absorption. Residues if present are of short duration.

Biology of sarcoptes

The genus Sarcoptes comprises various species of Sarcoptes scabiei. They are considered as host specific and designated as Sarcoptes scabiei var bovis, Sarcoptes scabiei var suis, etc., but this host specificity is not complete and transfer from one host species to another can occur (Sheahan, 1974).

* Dept. of Livestock Services, GTZ, Hariharbhawan.
** "Prelect" marketed by Beecham Animal Health, Keynsham, Bristol, U.K.

Sarcoptes scabiei is a minute parasite roughly circular in outline. The length and width of an adult female is respectively 447 μ and 343 μ and that of the adult male is 447 μ and 189 μ , (Leak, 1975). All the legs of both sexes are short and the third and fourth pairs do not project beyond the margin of the body. There is a sucker in the first, second and fourth pairs of legs of the male and in the case of the female only in the first and second pairs of legs (Leak, 1975).

The female burrows into the skin and lays eggs into the tunnel it forms. The life cycle of Sarcoptes Scabiei var human is described by medlany (1952, cited by Soulsby, 1982).

Probably the life cycle of the varieties found on other animals is similar. The six legged larvae escape from the breeding tunnel and wander on the skin, but some remain in the parent tunnel or side pockets of it and continue their development as far as the nymphal stages. The nymphs have four pairs of legs but no genital apertures. They may stay in the larval pockets or wander and make new pockets. Finally, male and female are produced. The life cycle from egg to egg laying female may last about 17 days. The female probably does not live longer than 3-4 weeks (Soulsby, 1982). Infection spreads mainly by contact by the wandering larvae, nymphs and fertilised young females (Sheahan, 1974; Cargill and Dobson, 1979a). Adult sows are often the source of infection for young piglets even though they show no signs of disease (Bogatako, 1974).

The mites are very susceptible to dryness and they did not survive in the absence of pigs for more than 12 days in the piggery, 3-10 days in manure or 10 days in outdoor pens. Air temperature ranged from 7°C to 18°C and relative humidity 65-75 per cent (Mikhalochkim, 1975). Under optimal laboratory conditions the mites have been kept alive for 3 weeks.

Epidemiology

Amongst domestic species, pigs are most commonly affected by Sarcoptes scabiei. It is a notifiable disease in most countries and is important because of its severity (Dobson and Cargill, 1979b; Sheahan, 1974). The main source of mites in infected piggeries is from chronically affected animals with ear lesions. Large numbers of mites can usually be found in the ears of normal sows which are in a latent stage (Soulsby, 1982). Ear lesions occur mostly in dry sows which are in contact with a boar in groups. In this situation there is maximum possibility for mite build up and minimal opportunity for mite control. Egg laying -stage mites are apparently responsible for more damage than male or immature mites (Walton, 1967). This is probably due to the greater activity and longer migration of egg laying females. Damage is increased by increasing the skin temperature, because the mites become more active (Bennett, 1975).

The infection spreads chiefly by direct contact between hosts. The female mites, larvae and nymph stages are capable of migration; the inert materials such as bedding, grooming tools and clothing may act as carriers. Eggs or mites that become dislodged and dropped in moist protected places may remain viable for 2-4 weeks in mild weather but they seldom survived more than a day or two in dry surroundings and exposure to direct sunlight (Bennett, 1975). Sows are often the source of infestation for young pigs even though they show no signs of the disease (Sheahan, 1974). Cargill and Dobson (1979b) stated that the piglets from chronically affected sows started scratching during the first few days of life. However, significant rubbing does not occur until the development of mite hypersensitivity about three to six weeks later. It is suggested that the sensitisation of the host occurred during the incubation period and that there was no itching until the host became sensitised (Sheahan, 1974). A small proportion of grower pigs which do not develop a hypersensitivity to mites, develop chronic mange (Cargill and Dobson, 1979b). The thick scab in which mites are found is not readily penetrated by insecticides treatment of a sow weighing 250kg costs Rs. 30/- (McPherson, 1960).

Materials and Methods

(a) The herd studied

The pork production farm has the capacity of 17 sows and one boar. Housing was in a kennel system. Each kennel measured 15ft x 7.5ft in which two or three adult pigs were kept. Half on the concrete floor of each kennel was bedded with straw. In the summer season dry sows and boars were placed in paddocks. In the past the sows (pre-farrowing) were treated with lice and mange wash.

The grower pigs were fed pellets ad. lib. Sows and boars were fed with pelleted ration according to their requirements.

In the first part of this experiment, 50 animals were involved of which 22 were sows, boars and gilts and 28 weaners. In the second and third treatment the same 22 sows, boars and gilts were involved because the rest of the herd had been marketed.

(b) Procedure for eradication attempt

The study was carried out in three stages:

- A. Assessment of the level of infection
- B. Treatment of the herd
- C. Assessment of the effectiveness of treatment regimen

Assessment of the level of infection was made in two ways:

1. Recording the incidence of scratching, rubbing and head shaking.

The scratching, rubbing and head shaking frequency figures were obtained by observing the behaviour of each pig in the groups for a 30 minute period.

2. Counting the number of mites in the ear wax along with skin scraping taken from the luminal surface of the ear of each pig.

(c) Sampling techniques

The samples were taken by scraping the inner surface of both left and right ears using special sharp-edged spoon. Then these samples were placed in centrifuge tubes and closed with lids.

The sampling instruments were kept in 70% Ethanol solution as a precautionary measure to prevent spread of mites into the surroundings.

(d) Laboratory examination of samples

The scrapings were placed on slides and examined under the microscope for the presence of live mites, using low power. The materials on the slides were replaced in centrifuge tubes and digested overnight in 5ml of a 10 per cent potassium hydroxide solution. Then the centrifuge tubes containing the samples with 5 ml of 10 per cent potassium hydroxide solution were placed in a waterbath which was gradually brought to boiling point (i.e. 100°C) for 10 minutes. When all the crusts and hairs were digested, the fluid in the tubes was allowed to cool. Then centrifuged at 2500 rpm for 15 minutes to deposit the mites at the bottom of the tubes. The supernatants were decanted leaving behind the deposits which were resuspended in the remaining fluid. The contents of the tubes were examined under the microscope using slides and 40 x 20 mm cover slips. The mites were counted and the results expressed as the total number of mites in each sample.

(e) Application of the medicaments

After assessing the level of infection, the treatment was carried out three times at an interval of one month.

The recommended dose of 20 per cent phosmet is 20 mg per kg. live bodyweight (1 ml/10 kg bodyweight). The product is supplied in 500 ml plastic bottles, which have a novel built-in measuring reservoir at the top, connected by tube to the main container. When the bottle is squeezed, the insecticide passes up the tubes into a graduated

measure. Thus, by simply squeezing the bottle, the correct dose can be transferred into the measure and then be poured over along the back of the pig. This process only takes a few seconds.

In addition a small part of the computed dose (1ml) was placed inside each ear flap by means of a plastic syringe. It was also directly applied to the crusts on other sites of the body. In case of piglets, a piece of cotton wool was soaked with a measured dose of 20 per cent phosmet and applied along the backs.

Clinical and laboratory evaluations of the effectiveness of therapy were repeated at a three month interval (without any mange treatment) after the last herd treatment. No new stock was introduced to the herd during this period.

(f) Statistical methods

The comparisons before and after treatment were made using students period t-test.

Result

Table 1 shows the prevalence of Sarcoptic scabies infestation before treatment in gilts, sows and boars.

Table 2 shows the results of treating the herd of pigs against sarcoptic mange using 20% phosmet. The effectiveness of this treatment was measured in terms of behavioural observations (head shaking, scratching and rubbing). There was a significant reduction ($P < 0.001$) in each of these activities following treatment (the differences were 3.6-0.2; 1.7-0 and 1.9-0.2 respectively).

Table 3 indicates the numbers of mites present both before and after treatment. The reduction in numbers following treatment was also significant (a t-test could have been performed but we considered superfluous).

Discussion

Failure to control or eradicate sarcoptic mange in the past has been largely due to the poor understanding of the epidemiology and the lack of knowledge of mite hypersensitivity. Producers have tended to regard rubbing in pigs as a normal phenomenon. Therefore, treatment has tended to start too late and be directed at the wrong animals. The problem has been aggravated because most treatments are water-miscible insecticides which are not satisfactory in penetrating mites covered by thick scab particularly in the ears of pigs.

In chronic infestation it is easy to isolate mange mites. But in recent time farmers use acaricides frequently on their own without consulting a veterinary surgeon. The owner of the herd in this study had for some time been treating sows and gilts with an acaricide in the pre-farrowing period. However, prior to the present eradication attempt sarcoptic mange mites were isolated from 64% of adult pigs. Therefore, the traditional treatment was not very successful. This keeps the level of infection very low and makes the isolation of mites difficult. Consequently the assessment of the level of infection is also difficult.

Eradication of sarcoptic infestation within a breeding unit is very difficult since a single oviparous female sarcoptic mite could be responsible for the production of a parasitic population of several thousand mites in an individual host within eight weeks (Walton, 1967). It is possible by exercising great care to keep a herd of pigs free from sarcoptic mange. However, due to failure of the human element the disease may re-appear in the herd of pigs (McPherson, 1960). Following eradication, all new additions to the herd must be isolated and treated on three occasions before they are allowed any contact with the rest of the pigs. Precaution must also be taken to prevent entry of infestation by any other route, such as pig waggon, trailers or contaminated equipment (Walton, 1967; Linnet *et al.* 1980).

Keeping the pigs on a well balanced ration of high nutritional value will keep them healthy so that they will be able to resist an accidental sarcoptic mites invasion. Keeping the pigs in groups of similar weights is very important for maintaining their general well-being and nutritional efficiency. It also increases their ability to resist mange and other diseases (Magee, 1974).

In proportion to the body size of the pig, the sample taken for the isolation of mites is very small. Therefore there is always the possibility of a negative result. Some research workers have stated that there are carriers without showing any clinical signs of mange. In such cases the only possible way of diagnosis is the hypersensitivity test. Little work has been done on this aspect, so this field of study is still wide open for research. While looking for the live mites in the sample, they may not be seen in the material taken but can be found wandering in the container. Therefore it is also essential to check in the containers as carefully as possible to find the mites. As the samples being examined are so small in proportion to the skin area, emphasis has been given to finding the mites in the different ways described in the practical project.

The results indicate that the observations of behavioural activities in pigs before and after treatment against Sarcoptic mange were related to infestation with sarcoptic mites. As soon as the mites have been eliminated the behavioural activities were significantly reduced and the pigs were resting comfortably.

The question of whether all sarcoptic mites have been eradicated from an infested herd, as a result of the application of therapeutic measures such as outlined in this paper, is not easily answered. If living mites are found after treatment, it can be assumed that either the acaricide or the mode of application was at fault. Field observations of this type cannot be precise but fortunately for this type of research, Sarcoptic mange is a disease which frequently progresses rapidly and the mites produce obvious and characteristic lesions. As the months pass, the lack of lesions gives assurance that the infestation does not exist in the herd. The author is of the opinion that examinations following the treatment should be thorough and frequent. As in this work, all the 22 pigs in the herd were examined at 10 and 90 days after final treatment.

90 days after treatment there were no signs of disease either clinically or by examination of samples. Keller et al (1972) stated that after final treatment the animals must be kept under observation for at least six months. This should include several check up for clinical signs and 2-3 skin check up. If these are negative, then the herd can be considered free of sarcoptic mange.

In the inner surface of the ear, where there is excessive wax and scab, all stages of the life cycle are progressing independently of the skin (Hewett, 1983). So 1 ml of the computed dose of 20% phosmet was applied to the inner surface of the pinna. In the same way, a small part of the computed dose was applied directly to such other sites of the body for a more rapid effect. The heavily crusted, leather-like area of skin at the base of the tail on a boar gradually loosened and dislodged leaving a healthy skin and hair coat in its place.

At the time of treatment most of the sows were pregnant and farrowed after the final treatment. The piglets did not show any signs of mange and were healthy. The piglets did not show any signs of mange and were healthy and growing well. During this period, kennels were not sprayed or disinfected with other insecticides but normal cleaning was carried out every day. As soon as the medicament was poured on the back, it spread out widely but in the case of hairy pigs the medicament slipped off from the thick surface of hair, so not reaching the skin. It is therefore essential to take care while treating the hairy pigs.

The owner was requested to observe the pigs to see if they showed any signs of abnormality during and after treatment. He reported that the pigs were seen to be resting comfortably and their thriftiness and general condition improved after treatment. In 90 days between the last treatment and the final observation and examination three sows were culled and 1 boar died fighting with another boar. Thus only 18 animals out of the original 22 were still in the study at its conclusion.

In comparison with sarcoptic mange remedies used in the past, the simplicity, safety, economy and effectiveness associated with 20% phosmet use for eradication is successful in a herd of pigs.

Conclusion

The results obtained from this experiment indicate that three treatments at monthly intervals for every pig on the farm using 20% phosmet is an effective means of eradicating sarcoptic mange.

Table 1: The prevalence of sarcoptic scabies infestation before treatment

Type of pigs	Number examined	Number positive	(%)
Gilts	6	3	37.5
Sow	12	9	75.0
Boars	2	2	100.0
Total	22	14	63.64

Table: 2 Behavioural observations of pigs; number of head shaking, scratching and rubbing per pig per half hour

Pig identi- fication	BEFORE TREATMENT			AFTER FINAL TREATMENT					
	Head shak- ing	Scratch- ing with hind legs	Rubbing against wall	On day 10			On day 90		
				Head shak- ing	Scratch- ing with hind legs	Rubbing against wall	Head shak- ing	Scratch- ing with hind legs	Rubbing against wall
12	3	2	2	0	0	0	0	0	1
11	3	1	4	0	0	0	0	0	0
10	4	1	3	0	1	0	0	0	0
2	4	2	2	0	0	0	0	0	1
23	19	3	4	3	1	2	0	0	0
Jimmy	5	1	1	0	0	0	x	x	x
26	5	3	2	0	0	0	0	0	0
Bella	6	2	4	0	0	0	0	0	0
Harriet	2	2	1	0	0	0	x	x	x
Sam	7	2	4	1	0	1	0	0	0
Sally	4	4	2	0	1	0	x	x	x
Susie	2	2	2	0	0	1	x	x	x
6	2	4	3	1	0	0	1	0	1
22	1	0	0	0	0	0	0	0	0
20	0	1	1	0	0	0	1	0	1
24	1	0	1	0	0	0	0	0	0
21	2	1	0	1	0	1	0	0	0
25	1	2	1	0	0	0	1	0	0
14	3	1	0	0	1	0	0	0	0
8	3	2	1	0	0	0	0	0	0
3	2	1	3	0	0	0	0	0	0
Henrietta	1	2	1	0	0	0	0	0	0
Total	80	89	42	6	4	5	4	0	4

x = One boar died, 3 sows culled.

Table 3: Number of sarcoptic scabies mites isolated from KOH digested scrapings from ears

Pig identification	Before treatment	After final treatment	
		on day10	on day 90
12	1	0	0
11	2	0	0
10	1	0	0
2	1	0	0
23	3*	0	0
Jimmy	3	0	died
26	1	0	0
Bella	1	0	0
Harriet	3	0	culled
Sam	3*	0	0
Sally	1	0	culled
Susie	2	0	culled
6	1	0	0
22	0	0	0
20	0	0	0
24	0	0	0
21	0	0	0
25	0	0	0
14	1	0	0
8	0	0	0
3	0	0	0
Henrietta	0	0	0

* Live mite observed in low power microscope

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EFFECT OF SEASON AND STAGE OF LACTATION ON MILK LACTOSE AND CHLORIDE CONTENT IN MURRAH BUFFALOES

*I.P. Dhakal & S.B. Singh**

ABSTRACT

An experiment was conducted to determine the effect of season and stage of lactation on milk lactose and chloride content in murrah buffaloes. A total of 37 buffaloes at different lactations were used in the experiment. The concentration of milk lactose recorded was higher during the summer (5.42 ± 0.04) and autumn months (5.23 ± 0.06) as compared to the winter (4.58 ± 0.07) and spring (4.53 ± 0.07). Milk lactose contents were higher during lactation (4.94 ± 0.10) than in the colostrum stage (4.02 ± 0.16) and the drying off period (4.68 ± 0.13). The milk lactose level rose slightly at the start of lactation and decline continuously throughout the rest of the lactation period. Milk lactose concentration showed an increase up to the 3rd lactation and decreased in later lactations. The concentration of chloride (gm./100ml) were higher during autumn (0.117 ± 0.002) and summer (0.110 ± 0.002), as compared to spring (0.104 ± 0.002) and winter (0.096 ± 0.004). In contrast to lactose, milk chloride concentration was found higher during colostrum stage (0.124 ± 0.002) and drying off period (0.134 ± 0.004) than during lactation (0.108 ± 0.003). The level of chloride increased in later lactations.

Introduction

The milk sugar lactose is a disaccharide synthesized in the golgi apparatus of the mammary gland secretory cells by a complex mechanism involving the enzyme galactosyl transferase in the presence of lactalbumin. However, the ability of the enzyme to synthesize lactose from its substrates glucose and galactose is decreased when the tissue of the mammary gland is infected resulting in a lower concentration of lactose in the milk (Giesecke and Van dan Heever 1974). Similarly, there are many other factors that

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may influence lactose content in milk. For example, season, stage of lactation, lactation number etc. Praphulla and Anantakrishna (1958 & 1959) reported that the lactose content of buffalo milk increased gradually during the first five months of lactation and the value remained steady towards the end of the lactation. In contrast, Adb. El Salam and EL Sibing (1966, a and b) found that the lactose content gradually decreased from the beginning to the end of the lactation period. Variations in the concentration of milk lactose in buffaloes according to the seasons have been reported by Mehta 1985.

The concentration of chloride in normal milk increases slowly through out the mid lactation and then rises rapidly as late lactation approaches (Schalm *et al* . 1971). They also reported that an inverse relationship exists between the concentration of lactose and sodium chloride in milk.

Since various uncontrolled factors other than health of the udder are known to affect the chemical composition of the milk, this investigation was conducted to study the seasonal variations as well as effect of stage of lactation on milk lactose and chloride content in buffaloes.

Materials and Methods

Thirty seven murrah buffaloes of first to fifth lactation from IAAS livestock herd were selected for the research. The number of animals included were 12, 10, 7, 5 and 3 in first, second, third, fourth and fifth lactations. Samples of about 20 ml milk were collected at monthly intervals during 1988/89 from each animal at the morning milking. These samples were analysed in the laboratory for lactose and chloride.

Lactose was determined by the method as described by Feitosa Teles *et al* (1978). Briefly 2 ml of milk was introduced into a 100 ml volumetric flask and diluted to 100 ml volume with distilled water. To a 2.5 ml diluted sample, 0.2 ml of 5% zinc sulphate solution and 0.2 ml of 4.5% Barium Hydroxide solution was added. After centrifuging the sample at 1 ml of supernatant from each sample was individually transferred in a separate folin Wu blood sugar tube containing 2.5 ml of Folin reagent (1 part of 1% phenol, 2 part of 5% sodium hydroxide, 2 part of 1% picric acid and 1 part of 1% sodium bisulphite). Then the tube was stoppered tightly and kept in a boiling water bath for 6 minutes. The tube was cooled immediately in tap water and volume was made up to 25 ml with distilled water. The lactose concentration was then measured at 520 nm. in spectrophotometer.

The concentration of chloride was estimated by the method as described by Sharp struble (1935). Briefly 17.6 ml of milk was placed in a glass beaker and 2 ml of 10% Potassium chromate was added. Silver nitrate solution containing 8.6245 gm of

silvernitrate/litre was added into the beaker from a burette until the first reddish orange colour is obtained. The chloride concentration was measured by multiplying the number of millilitres of Silver nitrate solution used by 0.01.

Results and Discussion

(A) Effect of Season on Milk Lactose and Chloride

As shown in Table 1 the concentration of lactose (gm/100 ml) and chloride (gm/100 ml) were measured during the winter (Nov-Jan), spring (Feb-Apr), summer (May-Jul) and Autumn (Aug-Oct) months. The mean lactose content (gm/100 ml) was in a descending order from summer to autumn to winter to spring (5.42 ± 0.07 , 5.23 ± 0.06 , 4.58 ± 0.07 , 4.54 ± 0.07 , respectively). However, the analysis of variance did not show any significant difference between different seasons. The peak level of lactose was found in May (5.59 ± 0.06) the level declined to a low point in (4.30 ± 0.13) February (Table 2). The possible reason for the low lactose content during winter and spring may be due to the higher concentration of fat of milks in these seasons because of increase in milk yield production by an animal. Schalm *et al* . (1971) reported that the lactose content decreases when fat content rises. Almost similar observations have been recorded by Mehta (1985). However our results do not agree with Chandra and Pachauri (1989) who observed higher milk lactose content during monsoon and winter as compared to the summer season.

The chloride content (gm/100 ml) recorded during autumn, summer, spring and winter showed a decrease in level (0.117 ± 0.002 , 0.110 ± 0.002 , 0.101 ± 0.002 , 0.096 ± 0.004 respectively). The peak level of chloride was found in October (0.120 ± 0.002). The chloride content declined in January (0.095 ± 0.002) (Table 2). There was no significant difference in the chloride content of the buffalo milk at different seasons.

(B) Effect of stage of lactation in milk lactose and chloride

Milk lactose and chloride content (gm/100 ml) in buffalo milk obtained during colostrum, lactation and drying off are shown in table 3. A higher level of lactose was found during lactation (4.94 ± 0.10) as compared to colostrum (4.02 ± 0.16) and drying milk (4.68 ± 0.13) but the difference were not statistically significant. The possible reason for the low lactose level may be due to higher concentration of the chlorides. Schalm *et al* (1971) pointed out that when lactose concentration in the milk decreases, chloride from the blood enter into the milk to maintain the osmotic pressure. Our result agrees with Rook (1965) Parekh and Gangwar (1968), Renner (1972) and Chandra and Pachauri (1989)

found that lactose content was low in the beginning, high in the mid lactation and decline in the drying period.

The highest level of chloride in milk was found during drying off (0.134 ± 0.001) as compared to colostrum (0.124 ± 0.002) and during lactation (0.108 ± 0.003) but the differences were not statistically significant. The possible reason for the higher concentration of chloride in drying milk may be due to a severe drop in milk production (Sharp and Struble 1935). Similar results have been reported by Carroll, E.J. (1961) who emphasized that when milk secretion is depressed, the chloride concentration of milk increases in proportion of decrease in lactose. Schalm *et al* (1971) pointed out that the chloride content of colostrum is high, but decreases rapidly as secretion of normal milk replaces the colostrum.

(C) Effect of lactation number

Table 4 presents the concentration of lactose and chloride (gm/100 ml) of buffalo milk in different lactations. The lactose content was highest in the third lactation (5.02 ± 0.15) as compared to the first (4.78 ± 0.07) second (4.82 ± 0.15) fourth (4.92 ± 0.17) and fifth (4.67 ± 0.08) lactation. However, an analysis of variance did not show any significant difference on lactose content between different lactations. Our result agrees with Chandra and Pachauri (1989) who found that milk lactose level showed an increasing trend with the advancement of lactation up to 3rd and decreasing trend in later lactations. However, Bergman (1979) reported that lactose increased slightly at the start of lactation, but declined continuously throughout the rest of the lactations. The possible reason for the decrease of lactose in later lactation may be due to an increasing amount of chlorides Carroll (1961) indicated that increased chloride content reflects the decrease of lactose.

Milk chloride concentration was found to be highest in the fourth (0.114 ± 0.002) and fifth lactation (0.133 ± 0.002) as compared to first (0.100 ± 0.002), second (0.105 ± 0.003) and third lactation (0.104 ± 0.003) but the differences were not statistically significant. The possible reason for it may be due to decreased milk yield in the later lactation.

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Table 1: Concentration of lactose and chloride in buffalo milk in different seasons (g/100 ml).

Seasons	No. of animal	Lactose (g/100 ml) Mean $\pm$ SE	Chloride (g/100 ml) Mean $\pm$ SE
Winter (Nov-Jan)	23	4.58 $\pm$ 0.07	0.096 $\pm$ 0.004
Spring (Feb - Apr)	22	4.53 $\pm$ 0.07	0.104 $\pm$ 0.002
Summer (May-Jul)	18	5.42 $\pm$ 0.04	0.10 $\pm$ 0.002
Autumn (Aug-Oct)	28	5.23 $\pm$ 0.06	0.117 $\pm$ 0.002

SE = Standard Error

Table 2: Concentration of lactose and chloride (gm/100 ml) of buffalo milk in different months.

Months	No. of buffaloes	Lactose (g/100 ml) Mean $\pm$ SE	Chloride (g/100 ml) Mean $\pm$ SE
Jan	23	4.66 $\pm$ 0.09	0.095 $\pm$ 0.022
Feb	23	4.30 $\pm$ 0.13	0.098 $\pm$ 0.25
Mar	23	4.75 $\pm$ 0.09	0.106 $\pm$ 0.033
Apr	22	4.52 $\pm$ 0.07	0.111 $\pm$ 0.49
May	22	5.59 $\pm$ 0.06	0.112 $\pm$ 0.037
Jun	24	5.13 $\pm$ 0.08	0.114 $\pm$ 0.035
Jul	26	5.50 $\pm$ 0.05	0.115 $\pm$ 0.025
Aug	28	5.57 $\pm$ 0.06	0.115 $\pm$ 0.035
Sep	28	5.03 $\pm$ 0.10	0.117 $\pm$ 0.026
Oct	28	4.93 $\pm$ 0.11	0.120 $\pm$ 0.023
Nov	23	4.34 $\pm$ 0.12	0.103 $\pm$ 0.018
Dec	23	4.75 $\pm$ 0.09	0.100 $\pm$ 0.020

Table 3: Lactose and chloride concentration in gm/100 ml of buffalo milk obtained during colostrum, lactation and drying off.

State of lactation	No. of animal	Lactose (g/100 ml) Mean $\pm$ SE	Chloride (g/100 ml) Mean $\pm$ SE
During colostrum	6	4.02 $\pm$ 0.16	0.124 $\pm$ 0.002
During colostrum	6	4.94 $\pm$ 0.10	0.108 $\pm$ 0.003
During drying off	6	4.68 $\pm$ 0.13	0.134 $\pm$ 0.004

SE = Standard Error

Table 4: Concentration of lactose (gm/100 ml) and chloride (gm/100 ml) of buffalo milk in different lactations.

Lactation No.	No. of animal	Lactose (g/100 ml) Mean $\pm$ SE	Chloride (g/100 ml) Mean $\pm$ SE
First	12	4.78 $\pm$ 0.07	0.100 $\pm$ 0.002
Second	10	4.83 $\pm$ 0.15	0.105 $\pm$ 0.003
Third	7	5.02 $\pm$ 0.15	0.104 $\pm$ 0.003
Fourth	5	4.92 $\pm$ 0.17	0.114 $\pm$ 0.002
Fifth	3	4.67 $\pm$ 0.08	0.1123 $\pm$ 0.002

SE= Standard Error

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THE ROLE AND RELEVANCE OF VETERINARY EXPERT IN THE TRIBUNALS OF NEPAL

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ABSTRACT

The awareness of the application of scientific knowledge in investigation and criminal justice is rather a recent phenomenon in Nepal. obviously, the importance of veterinary opinion in dispute cases is not much realised by the tribunals, however, the disputes in which a veterinary expert can be of great assistance to the arbitrator are quite common in Nepalese society.

This paper briefly describes the role and relevance of veterinary witness in the tribunals of Nepal. It also gives some examples of cases in which a veterinary expert can give his/her opinion that will best assist the tribunal in providing true and right decision.

Introduction

The opinion of an expert witness can be of great importance to the tribunal in giving guidance on technical matters. An expert possesses a specific skill or knowledge in a particular field acquired by virtue of his professional qualification, technical training and practical experience (Mildred, 1982). And a veterinary witness is an expert witness whose function is to assist the tribunal in providing a true and proper decision upon matters which involve the subjects of veterinary medicine.

A veterinary practitioner has diverse fields to deal within his professional career and the legal aspects connected are numerous (Lall, 1983). However, all veterinary practitioners can not be veterinary witness unless they have thorough knowledge of the subjects of their expertise as well as the legal procedures in criminal courts. In this paper no attempt

* National Forensic Laboratory.

has been made to cover all such diverse fields and their regulatory aspects but an over view of the role and relevance of a veterinary witness in Nepalese context is only outlined.

Admissibility of Veterinary Expert Opinion in Nepalese Courts

The history of criminal activities back to the history of man but the criminal investigation methods used in ancient societies were influenced by superstitions. An example of such methods in Nepalese society can still be seen where a witch doctor used to search for the thief and stolen goods by using a magic stick called "Dhanu".

However, in modern society, various branches of science have become an integral part of any system of justice. Similarly the knowledge of veterinary science has its own importance in investigation and criminal justice.

Although, in the past, there were customs and traditions established in Nepalese society to find out the truth in criminal cases, the introduction of scientific investigation in legal cases started only at the beginning of 1950s' (Shrestha, 1987). But this practice is still in the embryonic stage in Nepal (Tripathi, 1987). In this context it is not surprising to note that a veterinary witness is hardly asked by the courts to give his expert opinion.

The provision of submitting physical evidence or expert opinion has been made in "Evidence Act 2031". There are also some Nepalese laws such as the chapter on Homicide in "Muluki Ain" and some other rules made by the Supreme Court which have made provisions for the scientific examination of the objects related to crime but there is no separate Act specially dealt with the admissibility of veterinary expert opinion in the Nepalese courts.

Areas of Veterinary Witness

It will not be an exaggeration to say that all subjects of veterinary science are potential areas for a veterinary witness. But it is essential that a veterinary witness has competent knowledge in the field of his expertise. The area of the legal and regulatory aspects of veterinary profession covers a much wider sphere. But it is not possible to describe all aspects regarding health certificate, soundness certificate, slaughter house procedures, food hygiene, public health, control of animal diseases, euthanasia of animals etc. in this paper. Therefore, some examples of veterinary legal cases in which physical evidence is required of the purpose of criminal investigation given.

Following is a brief list of cases in which a veterinary expert may be asked to give his expert opinion:

Veterinary-legal examination of physical evidence	Purpose of examination
1. Post mortem examination of animals and birds	To ascertain the cause of death and the approximate time of death.
2. Examination of wounds.	To ascertain the approximate time of injury & the type of weapon used.
3. Examination of blood and blood stain.	a. To ascertain whether the given fluid/stain is blood or not. b. If blood, what species of animal it belongs. c. To know the relevance of the stain to the crime scene. d. To identify the particular donor of the blood.
4. Examination of other body fluids such as saliva, semen, vaginal swab etc.	a. To ascertain the nature of the fluid. b. To type the fluid for the identification of donor. c. To ascertain the case of bestiality.
5. Examination of hairs.	a. To know the species of animal. b. To corroborate the association of crime and the criminal.
6. Examination of flesh and tissue.	To know the species of origin of the flesh or tissue eg. for identification of dead remnant.
7. Examination of bone and teeth	To identify the species of animal, age and sex.

- | | |
|--|--|
| 8. Examination of animal body to decipher the alteration of description. | To investigate and ascertain the frauds in the sale of animals. |
| 9. Examination of animal products. | To identify the type of the product and ascertain its source.

To ascertain the quality of the products. |
| 10. Toxicological examination of viscera and body fluids. | To detect and identify the type of poison used in cases of malicious poisoning. |

Common Offences Related to Veterinary legal Cases in Nepal

It is very difficult to give a precise and exhaustive list of criminal and civil cases related to the field of veterinary science. But in general the number of such cases is comparatively low. In fact, the cases like mischief, cruelty to animals, bestiality are seldom filed, whereas the cases like frauds in the sale of livestock products are not always considered as serious offence by the law enforcement agencies.

The case record of National Forensic Laboratory, Kathmandu (Case record book, 1988-90) shows that besides the cases of blood, bone and hair examination in which every case must be checked for the species of origin, the number of other cases related to veterinary science are very few. Some of the examples of such cases sent to National Forensic Laboratory, for forensic examination are viscera examination in suspected malicious poisoning, adulteration of milk, identification and examination of poultry faeces etc. The record shows that suspected poisoning cases predominate over the other.

Conclusion

A veterinary expert may, play an important role to assist the tribunals of Nepal in providing a true and right decision. But at present, the application of veterinary jurisprudence in Nepalese courts is not much realised. In fact its contribution in real life is negligible. It is surprising to note that no Act concerned with veterinary practice has yet been enacted in Nepal. It is imperative to formulate such an Act and be enforced in the country. The areas of veterinary jurisprudence in Nepal should be identified and be informed to the judiciary and the law enforcing agencies for utilization in real life whenever it is needed.

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THE DEVELOPMENT OF THE DAIRY INDUSTRY IN NEPAL, IN PARTICULAR THE DAIRY DEVELOPMENT CORPORATION (DDC) AND THE PARTICIPATION OF THE DANISH INTERNATIONAL DEVELOPMENT AGENCY (DANIDA)

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Introduction

Nepal is one of the least developed and a poorest countries in the world. The population is about 17 million and per capita GDP is about 160 US\$. It is a landlocked country between China and India with an area of 141,000 sq. k.m. The population growth rate is 2.7 per cent.

The economy of Nepal is dominated by the agricultural sector. Approximately 94 per cent of the population are dependent on this sector for livelihood. Agricultural and the livestock subsector produce 65 percent and 15 per cent of the Gross Domestic subsector of the Nepalese economy. Livestock is an integral part of the Nepalese agriculture and are raised for various purposes including milk production (5,6,7,8,9).

Milk production and consumption is an important part of the Nepali tradition. For Asian standards Nepal has very high per capita consumption of milk, about 40 to 45 litres per year (1,2,3).

Nepal has about 6.4 million cattle and 3 million buffaloes. Their annual milk production is about 830,000 ton of which 70% is produced by buffaloes and rest by cows. The milk production capacity of a cow is about 400 litres while that of a buffalo is 750 litres per lactation.

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Consumption of commercially processed dairy products represent a small share of total consumption, 4 to 5%. Only a fraction of local raw milk production (about 3%) passes through local commercial producers. About two third is processed by the DDC, a corporation and the remaining by small private dairies (1,3)

This low percentage of the total estimated milk production being handled commercially is mainly reflected by the lack of infrastructure (roads) in the countryside, but also by the fact that many small producers actually have very little or no surplus milk to market.

DDC Activities

The DDC was established in July 1969 as a corporation under the 1964 Corporation Act with a board mandate to organize, promote and develop the dairy industry in Nepal.

The Specific objectives of the DDC are:

- a) To Provide a secure and reliable market outlet and a fair price to the rural milk producers.
- b) To supply hygienic, pasteurized milk and other dairy products to urban consumers at reasonable prices.
- c) To organize, promote and extend milk collection/production to meet demand.
- d) To establish milk collection and chilling centres, milk supply schemes, cheese production units, and other appropriate units to produce and market dairy products in high-potential areas of the country and
- e) To organize, encourage and promote Milk Producer's Associations (MPAs) to produce and sell more milk by providing technical and organizational support programmes.

With the above objectives, the DDC's operations are organized regionally with Milk Supply schemes (MSS) with Kathmandu (KMSS), Biratnagar (BMSS), Pokhara (PMSS), and Hetauda (HMSS). Recently DDC has established two other MSS, Mid-Western Milk Supply Scheme, Kohalpur (MWMSS) and Lumbini Milk Supply Scheme Butwal (LMSS).

In addition DDC has operated a Cheese Production and Sales Scheme (CSS) Which is responsible for ten Yak cheese, five buffalo cheese and one Cow cheese production plant.

Milk Production and Collection

The DDC collects raw milk from various MCCs and MPAs for further processing packaging of milk and milk products. DDC has a milk collection network, called the National Milk Grid (NMG) which is illustrated in Fig. 1 (10 & 11). This comprises:

- a) Six Milk Supply Schemes - KMSS, BMSS, HMSS, PMS, MWMSS, LMSS and one nationwide CSS.
- b) Four Dairy processing plants, at Kathmandu, Hetauda, Pokhara and Biratnagar.
- c) 31 Chilling centres (CC's).
- d) 295 Milk collection centres (MCC's).
- e) 124 Milk producers association's (MPA's).
- f) 16 Cheese production plants with their own milk collection mechanism.
- g) More than 50,000 milk producing farmers are supplying milk to DDC.

The collection of raw milk undertaken by DDC is indeed a very complicated activity and much blame has also been placed on DDC for not able to collect more milk and not providing service to many farmers.

However, without going into too much detail the reality is that DDC has indeed increased the quantity of raw milk collection considerable over the years. Since the early seventies and until 1989/90 the collection has increased ten times.

In 1985/86 and 1986/87 the collection was above 14 million litres but in 1987/88 due to spread of rumour among consumers and producers about radio-active contaminated milk powder being used by DDC after the Chernobyl accident, the farmers almost stopped to deliver milk and the consumers discontinued buying the milk.

This effected DDC badly however by paying special emphasis on extension works, revising the milk procurement price, functioning at a very close cooperation with DLS and the Lead Banks and promoting the Milk producer Association concept, it has been possible to recover the lost collection to 16.5 million litres in 1989/90.

In addition to this the cheese scheme produced around 150 mt. of cheese i.e. approximately 1.5 million litres of milk was collected for this production 1989/90.

In this relation it should also be mentioned that the surplus chilled milk from the other processing plants which is transferred to Kathmandu has increased considerably

especially during the last year 1989/90 which made KMSS less dependent on skim milk powder maintaining a satisfactory production level.

Due to the considerable fluctuation in the level of milk production over the year it can be forecasted that the KMSS will always need SMP to manufacture required volume of reconstituted pasteurized milk during the lean season.

For a number of years in the past a large proportion of the pasteurized milk produced in Kathmandu was indeed recombined using imported skim milk powder. During 1980/81 to 1986/87 6.700 mt. of SMP and 1000 mt of butter oil were received by DDC. A general scarcity of this commodity in the world market has created serious difficulties for DDC and other Dairy Industry in Nepal. The planning of establishment of SMP plan in Nepal should make the country less dependent on imports of dairy products, particularly the SMP.

The DDC ensures supply of wholesome milk in the urban areas around milk supply schemes site and provides a market outlet for milk produced by small farmers. The DDC sells its products through 391 milk booths, 11 special dairy shops and two dealers. It is estimated that 85 per cent of DDC's milk is sold through booths, 15 per cent is sold through DDC's own shops. The total milk and milk products produced by DDC is illustrated in the following table -1.

Table - 1: DDC Production of Dairy Products

Products/Fy	1985/86	1986/87	1987/88	1988/89
Pasteurized milk (000 litres)	23936	20790	11942	17379
Butter (000 kg.)	164	206	159	299
Cheese (000 kg.)	110	131	119	114
Yoghurt (000 litres)	416	304	286	417
Ghee (000 kg.)	21	50	32	82
Ice cream (000 litres)	28	20	17	16

The total number of staff working in DDC in 1988/89 was 1099 of which 442 (40 percent) were administrative staff and 657 (60 percent) were technical staff. It would clearly be unrealistic and uneconomical for a commercial dairy company to engage such a high

percentage of administration staff and this is indeed a serious constraint of DDC. The DDC has today about 31 staff providing extension services to farmers.

The present financial position of DDC is critical and has deteriorated to the level where a financial restructuring, including creation of a new capital base should be considered. Operational losses have been registered in almost every year since the establishment of DDC and accumulated losses now has exceeded NRs. 60 million. The amount of HMG total subsidies/ contributions of about NRs. 38 million over the past, is insufficient to balance the amount of accumulated losses. There are number of factors which have contributed to the financial breakdown some of which are as follows:

- a) The role of developmental activities assigned to DDC by HMG without specific subsidy.
- b) The collection of small quantities of milk from remote areas resulting in a very high transport costs.
- c) Large number of staff and pressure exerted to employ more.
- d) Low utilization of existing plant capacity and high fixed costs resulting in high unit costs of production.
- e) High seasonal fluctuation of milk collection.
- f) Price regulation both on producer price and consumer price imposed by HMG.

DANIDA Support to DDC

His Majesty's Government of Nepal (HMG/N) requested the DANIDA in 1973 to support dairy development activities particularly with regard to establishment of new Pasteurization Plants in Hetauda and Pokhara and a cheese factory in Nagarkot. The whole infrastructure for Hetauda Milk Supply Scheme, Pokhara Milk Supply Scheme and Nagarkot cheese production was established in 1976, 1980 and 1980 respectively. The support was provided as a loan, which was converted into a grant later on.

In 1985, again on the request of HMG/N, DANIDA completed a feasibility study for rehabilitation and extension activities of DDC. This project was approved by HMG in 1987 for implementation. This rehabilitation and extension work started in 1988. Presently the work is completed at BMSS, KMSS, Cheese Production and Sales Scheme (CPSS) at Lainchaur and approximately 80 percent work is finished in HMSS and PMSS. In dairy extension activities seven chilling centres, quality laboratory establishment, technical manual preparation, manpower training within and outside the country have been completed. The remaining rehabilitation work will be completed by the end of 1990.

In order to facilitate the implementation of the rehabilitation and extension work DANIDA assigned a consultant Carl Bro International to undertake the tender of contract and to supervise the work. The machinery supply contract was undertaken by Danish Turnkey Dairies (DTD) in cooperation with a local contractor Pacific Circle. In addition DANIDA also provided specific technical assistance services in the form of three advisers to DDC (Project Coordinator, Dairy Processing Engineer and Dairy Maintenance Engineer). (10,11,12,13).

The total support provided for the Danida Dairy Rehabilitation and Extension Project to the DDC was 95 million DKK which equals to approximately NRs 450 million.

DANIDA Participation in the Future Dairy Development

HMG/N requested DANIDA in 1988 to support the plans of establishment of an UHT plant processing facilities for skim milk powder (SMP) and the preparation of a ten year Dairy Development plan for the Dairy Industry in Nepal. DANIDA agreed to finance consultancy services for undertaking these activities and the contract was awarded to Carl Bro International who is cooperating with a Nepali Consultancy Firm, New Era.

The work was started only in 1990 although it was supposed to start early in 1989 but due to the Indian trade embargo and the consequent shortage of fuel in Nepal it could not be started in time. The final feasibility report on SMP and UHT plants is now given to HMG/N by DANIDA, for agreement for the establishment of a skim milk powder plant in BMSS complex.

The total capacity of the plant is proposed at 1500 to 2000 litres/hr to be converted into SMP. The UHT plant is not feasible at this moment, but may be so after some years if the fresh milk collection and quality is improved to a higher standard.

The establishment of this plant will ensure the SMP required in KMSS during the lean season for meeting the demand of the consumers of Kathmandu valley. (The required quantity of SMP can be produced from surplus milk collected in eastern Nepal during the peak season.) The plant will also produce SMP throughout the year but at lower level. There will be a great saving in transport costs when the plant is established on Biratnagar.

The total Danida construction for the establishment of the SMP plant would be about 16.6 million DKK which equals to NRs. 80 million.

For the preparation of the ten year Dairy Development plan a number of field surveys have been completed and a draft report will be submitted by the consultants through DANIDA to HMG/N.

It is of course premature to discuss at this stage to which degree and at which level DANIDA will participate in the future development of the Dairy Sector-however it is clear that the intention is there. After the submission of the draft report for the ten year plan a detailed discussion with HMG and other potential donors could identify clearly how the sector should develop and how the donor participation could be utilized in an optimal way to secure a satisfactory long term development.

A conclusive headline for any major dairy development in Nepal seems to be "small dairy farmer development and ownership participation in the milk processing industry". So far, this has been initiated through the promotion and establishment of Milk Producer's Associations and through certain Livestock services centre which is associated with credit facilities from ADB/N.

The privatization of commercial viable parts of DDC in the form of milk Producers Association (MPA) ownership and participation will probably be an important development in the future.

In order to secure a satisfactory level for dairy research, breeding, extension and training and development of new potential areas in the country it is of almost importance to identify which institutions should carry this responsibility and furnish them with the necessary facilities.

If the small farmers can see and feel their interest in participating in dairy development, the cornerstone is there for future assistance because potential basis exists for developing a higher production level per animal by breeding and selection measures, improved animal health, improved feeding and managerial practices.

Such a higher level of production would not necessarily require more fodder for the herd as on a long term basis the size of the herd could be even decreased considerably as presently a large proportion is "unproductive" and the herd size is large.

Furthermore the feeding of livestock in Nepal depends more on fodder trees and agricultural by-products. Thus almost feed competition does not exist with human feed requirements. A priority policy on livestock development and milk production in close interaction with forestry and agricultural development in Nepal could be of high value for the future.

This may finally lead to a situation where Nepal is not only satisfying the home market demand but it could even become a net export of dairy products.

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STREET FOODS AND DAIRY PRODUCTS: A SOURCE OF FOOD, INCOME AND HEALTH HAZARDS IN KATHMANDU

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Summary

The number and types of respondents included in the survey were 201 street shopkeepers, 101 milk vendors, 50 yoghurt sellers and 50 icecream sellers, besides laboratory analysis 200 specimens of various milk and milk products collected.

Out of the total street shopkeepers interviewed 15.9 percent of them were milk vendors who have started their business ranging from 5-20 years ago. The majority, 48.1 percent of the respondents replied that they sold the unsold stuffs next day. The range of individuals net profit was found to be from 2.5 percent to 67.5 percent however more than 50 percent of the shopkeepers had a net profit between 10 percent and 25 percent. About 20.9 percent of the shops were found to have very poor sanitary conditions and have street dogs at the premises.

Regarding the consciousness of teachers about the impact of street shops on public health most of them felt that eating such food cause Jaundice (20.3 percent), stomachache (20.3 percent), meningitis (18.0 percent), fever (16.6 percent), and diarrhoea (11.8 percent). Chemical analysis was found normal and up to standard. In bacterial analysis 6.5 percent of the samples have above normal mesophilic count/grams, 58.0 percent of the coli group above normal count/gms, yeast and moulds above 45.0 percent, staphylococcus 20.5 percent and 2.5 percent had salmonella infection.

The outreach of gastro enteritis in Kathmandu has affected over 15000 persons every year the epidemic has been caused by consuming contaminated street food and water.

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Introduction

During the past three decades urban population in Nepal have doubled but in Kathmandu alone it has increased almost threefold. One of the predominant features of this type of urbanization is the number of people crowding into substandard houses in the Kathmandu city. Overcrowding limits the space available for cooking and forces the most crowded families to buy their meals on the street. Lastly, traditional food often takes many hours to process and cook. Besides, this in Kathmandu city, socioeconomic changes have promoted of such street business during the last 15 years. The street food sellers act as an essential caterer of cheap ready made food for the community. These food sellers along with the consumers of the community constitute a public health hazard.

Street foods have been defined by FAO, as follows

"Street foods are ready to eat foods and beverages prepared and sold by vendors especially in streets and other similar public places". FAO has taken special interest in street food because of their extensive use in developing countries because of their impact on agricultural production and consumers health. FAO has a number of projects in regions of Latin America, Asia and Africa to evaluate problems associated with street food and work with governments to develop programmes improving the quality of food and safety of consumers.

Street foods are an important source of cheap, nutritious and ready to serve items particularly for the urban poor. The migration of people from rural areas to Kathmandu has led to a need for feeding large numbers of working people like porters, travellers, labourers etc. On a daily basis away from their residence. School children are also important buyers of street food.

Kathmandu city is getting more and more urbanized as there is a continuous migration of both rich and poor people from the hills and mountain regions. This is because rich people come to build houses and poor people, mostly unskilled ones, come to work as a seasonal or temporary labours. There is a problem of sanitation and milk hygiene in the street food thereby causing diarrhoea and other diseases to the group of consumers.

Therefore, it has become essential to study the status of dairy based food products handling and street food preparation practices particularly in Kathmandu city.

Methodology for Surveillance of Activities on Street Food

For all 33 wards of Kathmandu Municipality the sample sizes of the study were chosen arbitrarily which were as follows:

<u>S.No.</u>	<u>Types of population</u>	<u>Sample size</u>
1.	Street shopkeepers	201
2.	Milk vendors	100
3.	Yoghurt sellers	50
4.	Ice-cream sellers	50
5.	Consumers	200
6.	Food stuff specimens	200

The information were collected on different variables by using semi-structured questionnaires prepared and pretested. Samples collected aseptically for laboratory examinations were chemically analysed and tested microbiologically in central Food Research Laboratory.

Results

The period in years since the street have been selling dairy products is shown in Table 1.

Table 1: Duration of Street Shopkeeping and Selling of Dairy Products.

<u>Age in Years</u>	<u>Street shop Keeper No. (%)</u>	<u>Milk vendor No. (%)</u>	<u>Yoghurt sellers No. (%)</u>	<u>Icecream sellers No. (%)</u>	<u>Total No. (%)</u>
Below 1yr.	74 (36.8)	12 (11.9)	-	23 (46.0)	109 (27.1)
Since 1yr	75 (37.3)	25 (24.7)	17 (34.0)	27 (54.0)	144 (35.8)
Since 5yr	38 (18.9)	29 (28.7)	29 (58.0)	-	96 (23.9)
Since 10yr	10 (5.0)	21 (20.8)	4 (8.0)	-	35 (8.7)
Since 20yr	4 (2.0)	14 (13.9)	-	-	18 (4.5)
Total	201 (100.0)	101 (100.0)	50 (100.0)	50 (100.0)	402 (100.0)

Out of the total shopkeepers interviewed 36.8 percent of them have recently started their business and 37.3 percent started since one year and a few have maintained since many years. This indicates that the street shopkeeping business has expanded in an explosive way over the last few years. The milk vendors is clearly the oldest business selling milk and represented by fairly even age groups.

Types of Commodities Sold in Street Shops are Shown in Table 2.

Table 2: Type of Commodities Sold in Street shops

Type of Commodities	No. of shops	(% of shops)
Milk	109	(15.3)
Yoghurt	79	(11.1)
Khuwa	2	(0.3)
Chhurpi	49	(6.9)
Ghee	1	(0.1)
Pustakari	97	(13.6)
Sweets bread	73	(10.2)
Meat	33	(4.6)
Egg	83	(11.6)
Chau-Chau	32	(4.5)
Fruits	20	(2.8)
Bread	46	(6.5)
Other	89	(12.5)
Total	713*	(100.0)

(* a single shop deals with more than one commodity)

More than 10 percent shopkeepers sold dairy products. Their net profit range is shown in Table 3.

Table 3: Net Profit Ranges in Different Type of Milk Product Sellers

Net Profit %	Street shopkeeper No. (%)	Milk vendor No. (%)	Yoghurt No. (%)	Icecream seller No. (%)	Total seller No. (%)
Below 5	-	5 (5.0)	-	-	5 (1.2)
6-10	2 (1.0)	-	-	-	2 (0.5)
11-15	50 (24.9)	8 (7.9)	-	-	58 (14.4)
16-20	88 (43.8)	15 (14.8)	3 (6.0)	-	106 (26.4)
21-25	37 (18.4)	8 (7.9)	10 (20.0)	-	55 (13.7)
26-30	15 (7.4)	8 (7.9)	12 (24.0)	2 (4.0)	37 (9.2)
31-35	15 (7.4)	8 (7.9)	12 (24.0)	6 (12.0)	31 (7.7)
36-40	4 (2.0)	15 (14.8)	9 (18.0)	24 (48.0)	52 (12.9)
41-45	-	9 (8.9)	2 (4.00)	10 (20.0)	21 (5.2)
46-50	-	15 (14.8)	-	5 (10.0)	20 (5.2)
51-55	-	4 (4.0)	2 (4.0)	2 (4.0)	8 (2.0)
56-60	-	2 (2.0)	-	-	2 (0.5)
61-65	-	-	-	1 (2.0)	1 (0.3)
66-70	-	2 (2.0)	-	-	2 (0.5)
Not response	2 (1.0)	-	-	-	2 (0.5)
Total	201 (100.0)	101 (100.0)	50 (100)	50	402 (100)

The range of net profit of individual shopkeeper is found to be from 7.5 percent to 37.5 percent. The profit of milk vendors vary mostly and range between 10-15 percent. The highest profit was generally seen in yoghurt (20-40 percent) and icecream (30-50 percent).

The use of unsold leftover food at the end of the day is shown in Table 4.

Table 4: Use of Unsold Food Left Leftover Food at the end of the Day

Uses	No. of shops	(% of shops)
Sold next day	141	(48.1)
Self used	51	(17.4)
Thrown out	9	(1.0)
Kept safely	76	(25.9)
Kept in freezer	1	(0.4)
Eaten next day by warming	21	(7.2)
Total	299*	(100.0)

* In some questionnaire answers were multiple.

In response to the question as what do they do to the unsold food at the end of the day, the majority (48.1 percent) of the respondents replied that they sell it the next day and only 1% reported that they throw away unsold food.

Sanitary conditions in and around the shops was found was found to be uncleaned and 20.9 percent of the shops were dirty and had dogs in the premises. Most of the milk vendors (64.4 percent) did not use waste disposal containers. In average 63.1 percent of milk and its products were found to be fresh. Milk for sale was boiled by 76.2 percent of the vendors and the rest did not boil it. About 48.0 percent consumers did not have the habit of washing their hands before taking food.

Among the consumers interviewed 2.9 percent service holders and 11.5 percent were farmers. Opinions of teachers, ward leaders and consumers about the impact of street shops on public health is presented in Table 5.

Table 5: Opinions of Teachers, Panchayat Leaders and Consumers About the Impact of Street Shops on Public Health

Diseases	Teachers No. (%)	Panchayat No. (%)	Consumers No. (%)	Total No. (%)
Fever	72 (18.0)	25 (15.1)	-	97 (11.2)
Vomiting	-	-	30 (11.2)	30. (3.5)
Meningitis	78 (18.0)	21 (12.7)	6 (2.3)	105 (12.1)
Stomach ache	88 (20.3)	21 (12.7)	94 (35.2)	203 (23.4)
Diarrhoea	51 (11.8)	23 (14.0)	45 (16.9)	119 (13.8)
Tonsilitis	22 (5.1)	19 (11.5)	2 (0.7)	43 (5.0)
Jaundice	88 (20.3)	29 (17.6)	2 (0.7)	119 (13.8)
Others	34 (7.9)	27 (16.4)	88 (33.0)	149 (17.2)
Total	433 (100.0)	165 (100.0)	267* (100.0)	865 (100.0)

* In some questionnaires answers were multiple.

It has been observed from them that taking such food cause Jaundice (20.3 percent) stomachache (20.3 percent), meningitis (18.0 percent) fever (16.6 percent) and diarrhoea (11.8 percent).

Colour and odour were found normal in all the food samples. Fat percentage in milk and yoghurt were found below standard. Other total solids content in the food were found up to the standard. In bacterial analysis 6.5 percent samples have above normal mesophilic count per gms, 58.0 percent coli group above normal counts/gms yeast and moulds above 45.0 percent . Staphylococcus present 20.5% and 2.5 % had salmonella infection.'

Discussion

The outbreak of gastro enteritis in Kathmandu has affected over 15000 persons every year. The epidemic has been caused by consuming contaminated street food and water (Joshi et al 1988).

In this, study most of the samples were found adulterated. About 40 percent samples of ice-cream, yoghurt and khuwa were having mesophilic bacterial count more than 50×10^4 /gms which is above the standard limit. Coli group count were found above normal, 10/gm specimen containing above 10.gm. were unsafe. High presence of moulds and yeasts were found in ice-cream, yoghurt and khuwa. Staphylococcus were found in 60 percent samples of ice-cream and khuwa (Joshi et al 1988). Salmonellae were isolated in Six of the 200 dairy products tested. Salmonellae were isolated in Four of the 32 samples of ice-cream (12.5%) and two of the 94 samples of sweets tested (Joshi et al 1990).

In 1986 one of the study conducted in Pune (India) showed the highest microbial counts in many street food items examined. The average SPC was 2.54×10 , Coliforms 2.7×10 , and faecal coliforms 1.7×10 . Nearly 13.5 percent 219 water samples tested, from storage tank of street food vendors, did not meet the WHO standard for drinking water.

In Kathmandu family, Nepal 30 percent people working as a street food vendors support five people in their income. The role of man and woman is equal. It was reported that in Colombia 55 percent street food vendors support five people family in their income. In Ecuador 68 percent, in Nigeria 74 percent, in Indonesia 26 percent and in Thailand 65 percent street vendors service in this business.

FAO's Expert, on consultation agreed that street food should be recognized, legislated, controlled and promoted. The Codex Committee on general principles supported the proposal and suggested that, in coordination with the Codex Committee Food Hygiene 'Codes of Practice' should be drawn up by the various Codex Region Committees (Marco 1990). Food hygiene and sanitation problems in the street food sector is a universal one. There are a number of documented cases of food poisoning outbreaks due to street food. Most commonly found diseases, which can be spread by the use of contaminated food and water are cholera, typhoid, paratyphoid, bacillary dysentery, amoebic dysentery, hepatitis and tuberculosis. Training to the vendors and health education to the consumers are most essential. Personal hygiene and sanitation should be improved. Provision of licencing to the vendors as well as enforcement of food laws should be carried out. It seems quite clear that with the explosive growth in this business and with the health

hazard risk to the consumers, being a reality, close monitoring of the development of these streetshops should be undertaken.

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EFFICACY OF TRICLABENDAZOLE (FASINEX) AGAINST CHRONIC FASCIOLIASIS IN BUFFALOES

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ABSTRACT

Three buffalo calves identified to be infected with *Fasciola* spp. by faecal examination were drenched with triclabendazole (Fasinex) 10% suspension, at a the dose rate of 12 mg/kg body weight, and were stall fed on tree fodder for the whole experimental period. The animals did not recover and were again redrenched twice at an interval of 35 and 21 days at the same dose rate.

Even after the third drenching, the animals were still found to be suffering from Fascioliasis. On slaughter, adult flukes were recovered from their livers. The reasons for the inefficacy of triclabendazole in buffaloes are not understood. Until further research is carried out it is suggested that the drug should not be recommended for the treatment of Fascioliasis in buffaloes.

Introduction

Fascioliasis has been reported to be one of the main parasitic diseases of livestock in Nepal causing considerable loss in animal production. It is generally observed that in Nepal the disease is of a chronic type, and is mostly reported in buffaloes, which might be due to more attention given to this animal by farmers.

Several drugs have been used against this disease in Nepal namely Carbon Tetra Chloride (CTC), Hexathane, Oxyclozanide, Rafoxanide and more recently Triclabendazole (Fasinex).

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Triclabendazole at 10 mg/kg body weight dose rate, has been reported to be highly effective against mature and immature *Fasciola hepatica* in sheep, (Boray et al 1983). It was also reported to be highly effective against chronic *E. hepatica* infection in cattle (Besvir, 1986), buffaloes and goats (Mishra et al, 1987) and horses (Rubilar et al, 1988).

It was reported that Triclabendazole at 12 mg/kg body weight was 86%, 90%, 99% and 100% effective against 2, 6, 8 and 12 week old *E. hepatica* of cattle respectively (Shi et al 1989). However, Gupta, et al (1989) reported that Triclabendazole was found to be ineffective against *E. gigantica* infection of buffaloes even at 20 mg/kg body weight dose rate.

Triclabendazole (Fasinex) is a newly introduced product in Nepal, and has been recommended for the treatment of Fascioliasis in cattle and buffaloes. Different workers have reported the drug to be very effective for Fascioliasis treatment in cattle. However, its efficacy has not been evaluated so extensively in buffaloes, and so the present experiment was conducted to evaluate its efficacy.

Materials and Methods

Three buffalo calves found to be positive for *Fasciola* infection on faecal examination (sedimentation method), were drenched with 10% Fasinex (Triclabendazole) suspension at the recommended dose rate of 12 mg/kg body weight. These animals were stall fed on tree fodder and watered from tap water to avoid the chances of reinfection. Efficacy of the drug was monitored by regular faecal examination, and when *Fasciola* eggs were regularly detected in the faeces, the animals were again redrenched at the same dose rate on 35th day post first drenching.

Even after the 2nd drenching, all three animals remained positive for fluke eggs on faecal examination, hence, a third dose of the drug at the same dose rate was given 21 days post 2nd drenching. All animals still remained positive for fluke eggs after third drenching, and were slaughtered 10 days post taken out carefully, weighed and opened through bile ducts to collect the flukes present. Individually, livers were cut into small pieces, squeezed and then macerated. The macerated liver mass was screened through an ordinary wire mesh sieve, and flukes present were recovered, counted and measured.

Results and Discussion

The result on the efficacy of Triclabendazole (Fasinex) against Fascioliasis in buffaloes are presented in Table 1.

Table1: Efficacy of Triclabendazole against Fascioliasis in buffaloes

Tag No. of animals	Body weight (kg)	Dose of Triclabendazole wt.	Date of Drenching			Date of slaughter	Nos. of Flukes recovered
			1st drenching	2nd drenching	3rd drenching		
48	105	12mg/kg	31.12.89	4.2.90	24.2.90	5.3.90	120
76	125	12mg/kg	31.12.89	4.2.90	24.2.90	5.3.90	15
275	123	12mg/kg	31.12.89	4.2.90	24.2.90	5.3.90	1

The intact flukes recovered from the livers were individually measured for their size. The average size of recovered flukes is presented in Table 2.

Table 2: Size of the recovered flukes

Tag of slaughtered animals	weight of liver (kg)	No. of recovered flukes	Average length (mm)	Range (mm)
48	1.9	120	26.8 + 0.48	20-39
76	2.0	15	31.2 + 1.92	23-39
275	2.3	1	28	-

Morphologically, the recovered flukes resembled *E. hepatica* and *E. gigantica*, and the size of the recovered flukes indicated that the population was comprised mostly of adult (mature) flukes.

From the result of the present experiment it is evident that Triclabendazole (Fasinex) at the dose rate recommended for cattle (12 mg/kg body weight) has not been effective as reported by Gupta et al (1989) where the drug was found to be highly effective against *F. gigantica* infection of sheep, goats and rabbits, but ineffective in buffaloes, even at a dose rate of 20mg/kg body weight. On the other hand, Mishra et al (1987) reported the drug to be highly effective in buffaloes, when the efficacy was evaluated on the basis of

EPG (eggs per gram of faeces) post drenching. Different workers have reported Triclabendazole as being very effective against mature and immature *E. hepatica* in cattle, sheep, goats and even in horses (Richards et al 1988), but its efficacy against Fascioliasis in buffaloes has not been found to be similarly effective as for the other animal species as reported by these workers.

The reason for its inefficacy in buffaloes is not known. It might be that perhaps the pharmacokinetics of the drug are different in buffaloes, or it may be that a higher dose level is required in buffaloes than that recommended for cattle or other animals.

In field treatment it has also been observed that cattle, sheep or goats remained free from fasciola eggs for 3-4 months after drenching, but in some of the drenched buffaloes, fluke eggs were still detected regularly detected.

The present findings indicate that until further investigation is carried out, and new recommendations are available regarding the dose rate and pharmacokinetics aspects, it would not be advisable to recommend the drug for the treatment of Fascioliasis in buffaloes. However, it can be regarded as an effective drug for Fascioliasis treatment of cattle, sheep and goats.

Though the drug is recommended by the manufacturer for treatment of immature and mature infection of *E. hepatica* and *E. gigantica* in buffaloes, the present experiment indicates that the drug is not effective against mature flukes of buffaloes.

Therefore until more information is available, it would not be advisable to recommend Triclabendazole for the treatment of Fascioliasis in buffaloes.

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EPIDEMIOLOGICAL STUDIES OF FOOT AND MOUTH DISEASE OUTBREAKS IN AN ORGANISED FARM

R.M. Shrestha and S.B. Malla *

Foot and Mouth Disease (FMD) is an acute and highly communicable viral disease of cloven footed animals. In Nepal, it is endemic and cases are seen in cattle, buffaloes, sheep, goats and pigs and also noticed in elephants among wild animals. FMD has constituted a major threat to the livestock productions and the economy of the nation for many centuries. Hassel and Associates have estimated the economic loss due to FMD in Nepal is 123.3 million Nepalese Rupees in 1985 and expected economic loss by the end of 1990 is 134.4 million Nepalese Rupees.

For the last 4 years the average number of FMD samples collected annually were about 125 by National Epidemiological Laboratory for FMD, Budhanilkantha. Of the seven serotypes of FMD virus, three serotypes viz. O, A and Asia 1 are found to be the causative serotypes for FMD outbreaks in different parts of our country. Serotypes C has not been identified so far from the samples collected. Serotypes D, is predominantly involved in the causation of the condition in case of exotic pigs and cattle in various regions of Nepal.

The outbreaks of Foot and Mouth Disease are noticed in one or other parts of the country throughout the year irrespective of the altitude and climatic variations. However the surveillance reports of last 3 years collected by the laboratory revealed that prevalence of the disease is much higher during the rainy season or when monsoon set into the country. Interestingly FMD outbreaks were coincident with ploughing, farrowing, planting and even during harvesting. But it has to be pointed out that there was no time during which this disease did not occur through out the year.

It was mainly intended for the epidemiological studies of FMD outbreaks in piggery and dairy units of Livestock Farm Management section, Khumaltar, Lalitpur. It is located at

* National Epidemiological Laboratory for FMD, Budhanilkantha, Kathmandu.

Khumaltar of Lalitpur Municipality and is about 7.0 Kms to the south of Kathmandu city at an elevation of 1360 metres. This section is mainly aimed in carrying out research and extension activities and maintains Jersey, Holstein Friesien, Brown swiss and Ayresire breeds of cattle, and Yorkshire, Land race and Hampshire breeds of pig in both pure breedlines and crosses. The epidemiological studies of FMD outbreaks in both piggery and dairy units are discussed separately.

PIGGERY UNIT

The piggery unit consisted of total 57 pigs of which 3 boars 22 sows, 15 male piglets and 17 female piglets before the outbreak of the disease. The symptoms of the disease was first noticed on 14.10.046 in one adult sow and later spread to the most of the animals kept in the pens facing east direction of north-south oriented pig shed. Interestingly most of the pigs kept in the pens facing west were unaffected by the disease. Thus we presumed as the direction of wind flow was from west to east during the time of outbreak. It is of utmost relevant to mention that FMD virus is a useful model for the study of wind borne disease. The virus direction of spread is related to the flow of wind.

Outbreak & Vaccination History

There was no previous history of FMD outbreaks in this unit of the farm. However there was a sporadic outbreaks in the villages of Dhapakhel, about 1.5 km. south of this farm farm about 3 months earlier. Virus serotype 'O' was identified as causative agent for the disease outbreak. Routinely the animals were vaccinated previously but from last year it was stopped vaccinating pigs as the Hoechst vaccine manufacturer stated that FMD vaccine is not effective for the prophylactic measures against FMD in case of pigs.

Possible reason of outbreak

The source of infection might be farm workers who come for work from the surrounding villages of Dhapakhel and others where FMD was prevalent.

Lesions

Majority of affected pigs had lesions on snout, gum, inter digital spaces and on teats in case of sows. Samples were collected from foot epithelium in 50% Phosphate Glycerine buffer solution and brought to the laboratory for typing of virus. The labouratory analysis of foot epithelium revealed the presence of virus serotype 'O'.

Economic losses

Altogether 40 pigs were affected by Foot and Mouth Disease and lasted for 12 days. During the month of outbreak there were 4 farrowings and 33 piglets were born. Among them 25 piglets were stillbirths and the rest died within 48 hours.

Piglets born prior to the outbreak (7 in nos.) also died of Foot and Mouth Disease. The estimated loss due to piglet mortality amounted Rs. 11,200/- at the rate of Rs. 350/- per piglet. In two sows and 10 piglets the hooves were lost due to FMD and premature sale of such animals would incur a loss of about Rs. 2000/-

The treatment costs during this outbreak was about 2500/-. The overall loss amounted Rs. 15700/-

Although there were considerable reduction in body weight among the adult stock, the exact loss was not assessed.

DAIRY UNIT

At the time of outbreak the herd of this unit consisted of total 135 animals of various exotic breeds viz. Jersey, Brown Swiss, Ayresshire and H.F. in pure breed lines, as well as cross breeds at various blood levels. Out of 135 animals, 52 were calves and 83 were adult stock.

Morbidity & Mortality

	Calves	Adult Stock
No. of affected population	42	18
Morbidity	80.7%	21.4%
Mortality	Nil	Nil

Lesions

Affected animals showed both foot as well as mouth lesions. Affected cows had also teat lesions. The mouth lesions were collected and analysed in the laboratory and revealed 'O' type virus serotype

Vaccination history

History of vaccination indicated that the herd was vaccinated and the time lag between last vaccination and the first outbreak affecting six animals was 20 weeks (5 months) only.

Possible reasons of outbreak

The receding antibody levels and prevalence of a heavy concentration of virus at piggery unit might have contributed to the outbreak in the dairy unit.

Economic loss

Based on the data on milk production prior to and after the outbreak, it was found that on an average, 70 litres of milk per lactation per cow was lost. At this rate the total loss of milk from 15 milking cows was 1050 litres costing Rs. 8400/-. Discarded milk of about 500 litres (one week production) to prevent spread of infection would cost another Rs. 4000/-. The treatment cost during the outbreak was about 5000/-. The total cost would be Rs. 17400/-

The effect of Foot and Mouth Disease on fertility also contributed a major economic loss.

Interestingly there were no outbreak in the adjoining Artificial Insemination Centre, where exotic cattle bulls were maintained for the regular collection of semen. The last vaccination in this centre was also done almost at the same time as in dairy unit. The reasons could be:

- a) Well nourishment
- b) Good hygienic environment
- c) Restriction of animals movement outside its premises
- d) Proper Management

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PRELIMINARY STUDY OF KHARI DISEASE OF BUFFALO IN BAITADI DISTRICT

D.R. Ratala*, P.Manandhar*, G.R. Pant. **

ABSTRACT

A chronic disease of unknown etiology in buffalo, locally known as Khari disease with high morbidity and mortality was reported from Darchula district in Jan: 1988. A similar condition was also reported from Baitadi in April 1989. A survey of incidence of Khari disease in buffalo in Baitadi & Darchula district was conducted.

The data revealed 34.7% morbidity and 26.2% mortality rate due to Khari disease among the buffalo in the survey areas. High incidence of Khari disease in the winter months especially during the critical feed shortage was confirmed. The morbidity and mortality rate of Khari disease in stall-fed buffalo was found 36.5% and 28.5% respectively while these were only 28.2% and 17.9% in grazing buffaloes.

Out of 28 skin scraping microscopically examined 27 (96.4%) samples demonstrated Psoroptic mites. These mites morphologically resembled Psoroptes natalenses is but further validation is needed.

5 samples of necrosed material were obtained from the hoof and inoculated in blood agar and Sabourauds media yeild no growth. Clinical examination of 57 buffaloes in various locality of Baitadi district concluded Psoroptic mange was not the only cause & some soil borne bacterial infection was also suspected.

25 clinically affected buffaloes treated with Ivomec @ 200 mcg Ivermectin per kg. body weight by subcutaneous route reponded well and recommended for the treatment of Khari disease.

Further study to investigate the causative agent of Khari disease is strongly recommended.

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Introduction

A chronic buffalo disease, characterized by eczema, swelling of joints, bone deformity, cracking and necrosis of the hoof finally leading to death was reported from Darchula district in the winter of 1988. A similar condition was also reported from Baitadi in Jan. 1989.

Field visit and frequent contact with farm families, animal health workers in that region and clinical examination of the affected buffaloes have yielded vital informations about the disease. Though, these informations were insufficient to derive any conclusion but revealed wide distribution of this disease within these two districts and even in the, adjoining parts of the neighbouring Bajhang and Dadeldhura district. Locally this disease is known by many names such as Khari disease, Dhulkule, Chaukhuri and Barah.

This unknown disease probably could have existed in Darchula long before it has been brought into attention officially only in Jan. 1988. Farmers do not notify any outbreak to the authority concerned unless their services are urgently needed. Topographical condition and remoteness is the another handicap regarding the frequent contact of the animal health worker with the farmer community.

Field study revealed that Khari disease is a serious problem compare to any other disease in that locality. Mortality rate of Khari disease, once established clinically is nearly 100%. Little is known about the chronology and clinical pathology of the disease process. Slow but progressive nature of the disease is not fully understood at present.

Factors causing Khari disease appear to be many and complex. Species, sex, age, nutritional status, management along with environmental components such as season, rainfall and temperature are the factors influencing the susceptibility. No domestic animal other than buffalo was infected and the disease is not evident in cattle.

Incidence of Khari disease is much greater in the winter months although isolated cases may occur at any time during the year. Spontaneous recovery in the rainy season has been observed. Buffalo of any age group from young calves upwards may be infected but stall-fed milch buffalo housed for long period in close confinement were more susceptible than range buffalo. Khari disease was endemic throughout the district but incidence rate goes up in high altitude as well as Buffalo raising pockets near the vicinity of forest reported more endemic.

Introduction of the infection to a clean herd by a carrier buffalo was often observed but did not necessarily develop a disease. All the infected buffalo did not transmit disease to their offsprings. Suckling calves were either immune or possessed the disease without any

clinical entity. Indirect transmission to other herd was unknown. The role of arthropod vectors could not be ignored as the mechanical carrier of the causative agents. Infected buffalo was the only known source of infection. The role of other domestic or wild animals as a reservoir or carrier was not understood at present.

As known prepatent period of Khari disease was quite long ranging from 1-2 months. There was gradual loss of condition over several months and eventually the clinical evidence of Khari disease occurred.

General symptoms of the disease includes unthriftiness, partial anorexia, emaciation, anaemia, intermittent diarrhoea at the early stage of the disease followed by constipation, little or no cough, occasionally haematuria. Affected animal was reluctant to move or lie down. However, it is important to note that there was no febrile reaction during the course of disease.

Perineal region were often first affected & visually the condition began as erythema followed by pox-like small vesicles formation. Intense itching and irritation aggravated the condition. Rubbing and scratching against hard objects, which lead to self-inflicted trauma and alopecia.

Bran like scales (pityriasis) were evident and accumulated on the skin surface. Removal of deep scales left a red surface. Hair coat was dry and eczema developed on the back, neck, shoulder and legs due to persistant scaling.

Joint lesions were most common in the elbow, hock, stifle and knee joints and characterised by swelling, lameness and stiffness. Animal tried to put little weight on the affected foot and the gait was impaired. Swelling of the coronet was obvious. Typical lesions occurred in the sole of hoof in form of a fistula extruding khari powder (chalk powder) like material and had characteristic foetid odour. More than one feet were commonly infected. The sole became thin and exposed the sensitive part of the hoof. This condition was apparent only 1-2 month after the onset of the primary skin lesions. About 80% of affected buffaloes showed hoof deformity. The fistula was particularly confined to the bull of the heel.

There was poor response to the symptomatic treatment with antibiotics, acaricides & herbal medicine. Grain feeding to correct the dietary deficiencies was incompatible. While feeding of gur (unrefined sugar) had some beneficial effect. Anthelmintic drenching followed by table egg supplementation orally was beneficial (Dr.Karki, personal communication).

High mortality, long time illness and reduced productivity caused by the disease resulted in severe economic embarrassment.

Materials and Methods:

Realizing the need of appropriate information about the nature, incidence, epidemiology and economic losses due to this unknown disease, a household and key-informants survey questionnaire were designed. Both open and closed ended questions were included in the questionnaire. 34house hold, from Baitadi and 9 households from Darchula were selected randomly. Interview of the buffalo owners noted accordingly.

Complete clinical examination of 57 infected buffaloes in different ecological zones were performed during May 1989, Jan 1990 and May 1990.

A total of 28 buffaloes; 15 from Baitadi and 13 from Darchula districts showing characteritric signs and symptoms of Khari disease were selected to collect scrapings. Scraped materials were collected in a sterile vials and were brought to Central Animal Disease Research Division for further analysis. Samples were treated with required amount of warm 10% koh. Processed samples were examined using low and high power objectives of the Microscope. Temporary mount were prepared using Dipex.

Five samples of necrosed (Khari-powder like) material were collected aseptically from the fistula of the hoof and transported safely to the laboratory for examination of becteria or fungi.

Ivomec¹ in jection was given by subcutaneous route at the approved dose level of 200 mcg. ivermectin per kilogram of body weight to 25 clinically affected buffalo. Response of the drug on each and every buffalo was moitored on 4th and 14th day post in jection. On 15th day post in jection, repeated in jection of Ivomec was given and monitored as above.

Results:

Survey of 43 house-hold in Baitadi and Darchula district revealed 34.7% morbidity and 26.2% mortality rate due to Khari disease among buffalo. Ividence rate was comparatively higher in Darchula (43.5%) than Baitadi (31.5%).

Morbidity and mortality rate was according to the stage of production. In the house-hold survey report 5 (11.5%) respondents considered the lactating stage the most susceptible while 4 (9.3%) herdmen believed the pregnant buffaloes the most susceptible. In the opinion 34% or 79.1% owner, Khari disease is vulnerable to all stage (lactating, Pregnant and dry) equally.

¹ Ivermectin M.S.D. Trade mark of Merek & Co. Inc, Rahway, New Jersey, U.S.A.

Mortality was scattered in all age and sex groups according to the susceptibility of the animal.

Results of the survey about the feeding of mouldy hay and maize showed 34 (79.1%) house-holds fed low quality hay and maize stovers to their buffaloes where as 8 (18.6%) owners did not. Only 1 (2.9%) did not response to this question.

Out of 43 house-holds only 10 (23.3%) sent their buffaloes for grazing while 33 (76.7%) house-holds adopted stall feeding system. Khari disease incidence was found higher in stall fed buffaloes (36.5%) in comparison to grazing buffaloes (28.2%). Similarly mortality rate was 28.5% in stall fed buffaloes while this rate was only 17.9% in range buffaloes. Recovery rate was found higher in grazing animals.

A total of 28 skinscrapings were examined microscopically for the presence of mange mites. 27 (96.4%) samples were positive for *Psoroptes* mites. All developmental stages of mites such as eggs, larvae, nymph, adult male and female were identified according to their morphological characters as given by Soulsby (1973). Proportion of male to female mites was found 3:1 just reverse as described by the same author. Based on the feature mentioned above and host specificity mites were specified as *Psoroptes natalenses* but needs further confirmation.

Five samples of necrosed (khare powder like) materials obtained from the fistula of hoof and inoculated in Blood Agar and Sabouraud Media yeilded no bacterial or fungal growth. Apart from the psoroptes mites other specific pathogens were not detected.

25 clinically affected buffaloes treated with Ivomec showed good response on subsequent monitoring and evaluation.

Discussion

In the field situation, the incidence rate of Khari disease could be higher than reported because the prepatent period is not known accurately and early screening of the infected buffalo is not possible. Secondly owner do not want to disclose the fact, due to possible marketing problem. Higher incidence of the disease in Darchula district might be due to less number of household included in the survey or other variables such as geographical disparity and microhabitant.

Out break of Psoroptic mange in buffalo with a morbidity rate of 26% and 2% mortality rate was recorded in Nuwakot district by Ratala *et al* (1989). Sporadic cases of psoroptic mange in buffalo comparable to the survey area, have been reported in India as stated by Ruprah *et al* (1980). Critical survey by Shastri and Ghapoor (1974) and Maske (1979)

have recorded 69.7% incidence of psoroptic mange in Indian buffaloes. Skin scraping obtained only from the clinically affected buffaloes, could be the possible variable factor for the high incidence of psoroptic mange (96.4%) in this study.

Buffalo was the only species susceptible to Khari disease where as the cattle were either resistant or remained in quiescent phase. Clinical examination of the cattle housed together with buffalo has established the fact that the etiological agent was host specific and inter species transmission did not take place.

Susceptibility according to the stage of production is some what confusing. Buffalo, a seasonal breeding animal generally at lactating stage in Autumn and Winter when Khari disease co-exists. As a result, certain percentage of owner blame pregnancy and lactation as the predisposing factor, might be just a co-incidence. Lowered host resistant during pregnancy and lactation is a well known fact and cannot be ignored in Khare disease.

Biotic potential of the causative agents and altered host susceptibility due to dietary deficiency seems vital as the seasonal fluctuation is concerned. High stocking density and changed microhabitant either lower the host resistance or enhance the development of the causative agents. If the psoroptic mange is the only cause then the seasonal fluctuation pattern is clear. Latent or quiescent state of psoroptic mange in the protected spot or reservoir sites with less active feeding and decreased oviposition during summer and early Autumn, has been reported by soulsby (1973). Blood and Handerson (1974), and Urquehart *et. al.* (1987). According to these authors moistness and cool temperature is an ideal condition and parasite spreads allover the body rapidly in the cold months.

In the field situation it was perceived that mouldy hay, corn stalk and maize stovers which may contain toxigenic species of moulds and fungi are fed to buffaloes extensively. Buffalo housed in muddy floor with plenty of moulds and fungi growth are easily exposed to the spores of these toxigenic species than the grazing buffaloes. Out-break of Khari disease in grazing and indoor buffaloes without these diets, has confirmed that it is not the only cause. Dry leaves and unpalatable weeds, such as brackenfern (*Pteridium aquilina*), used as leaf litter and more likely to be consumed if the animal is continuously underfed. Clinical symptoms and febrile reaction in fern poisoning makes a distinction from the existing Khari disease.

Cummulative effect of toxic plants, inadvertently consumed especially during the critical feed shortage may cause similar harmful effect, have not been identified.

It is difficult to suggest a basic underlying cause of high incidence in Khari disease in stall-fed buffaloes. Various critical assessment have concluded high incidence of Psoroptic mange in indoor buffaloes. Dietary intake quantitatively is more or less the same as in grazing animals because over crowding and over grazing of the community pasture is common in these areas. While wandering in the forest in search of palatable grass and fodder, energy loss is greater in grazing animals than stall-fed animals. Temporary relief by the supplementation of energy rich ration such as Gur (unrefined sugar) indicates the dietary deficiency of energy. Housed buffaloes are forced to stand for long time in mud, urine and faeces soaked ground or bedding while the grazing buffaloes get the chance for wallowing and violent kicking of the limbs. Selfinflicted predisposing Injury in the hoof can be invaded easily by the common inhabitants of the soil, urine and faeces in stall-fed condition than in range condition. Common occurrence of lesions in the lower parts of the feet especially in the hoof suggest that the causative agents are soil borne and gain entry through such type of minor injury., In grazing animals the above conditions are prevented naturally.

Chorioptes bovis has been described as the possible precipitating cause of footrot in cattle (Blood and Henderson, 1974). In khari disease too, foot lesions similar to footrot of cattle have been observed but the role of *Psoroptes natalensis* as possible precipitating cause is not clear at present.

Interaction of existing pathogens to the acquisition of new infection results in exaggerated clinical disease. Such type of stipulation between cattle Fascioliasis and sarcoptes mange has been reported by Urquhart et. al (1987). Whether such type of interaction exists in khari disease is yet to be investigated.

In intensive husbandary system, deficiencies of vitamins and trace elements are relatively rare except in specific conditions like inadequate dietary intake, defective absorption, enhanced excretion and increased requirements.

Is the leading cause of khari disease is only psoroptic mange ? If yes, what is the clinical pathology of the foot lesions ? If psoroptic mange is only predisposing factor then what is the main causative agents involved ? Is the causative organism eliminated from the body of the host animal or lodge else where, if so where ? Under which circumstances may the unknown disease reappear ? what is the role of other domestic or wild animals as a carrier? still, many questions are yet to be answered in relation to the epidemiology of khari disease.

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ARTIFICIAL INDUCTION OF LACTATION

— A CASE REPORT —

Y. P. Yadav *

The animal breeding programme in Nepal with limited number of exotic and cross bred animals is affected due to known or unknown cause of sterility and infertility.

In some animals we can identify the etiology and in some we can not. Even in the identified cases we can not treat due to lack of resources and are left uncared by which the farmers may face a great loss.

In the following trial an effort was made to get the milk from an infertile cross bred Holstein cow through hormonal treatment.

History

A farmer in Dharan had a Holstein cross bred cow of 4 years age. The cow was brought to vet. hospital, Biratnagar with a history of irregular oestrus. In three consecutive heat, A.I. had been done without conception. Then the cow was examined to find the cause of repeat breeding which was due to cystic ovary. The cyst was removed manually per rectum thrice at the interval of one month. Thus the cow had non-ovulatory heat due to relapse of cystic ovary. Then it was decided to undertake hormonal treatment for artificial induction of Lactation.

Treatment Adopted

The line of treatment was adopted as follows: 40mg. of Vetestrol and 125 mg of Progesterone were injected sub. cutaneously for 5 days. Dexamethasone was injected 20 mg per day for 3 days after the 12th day of 1st Injection.

* Veterinary. Hospital, Biratnagar.

From the first day of treatment 4 tabs of Leptaden and 100 ml. Kalzol, Vimeral and 50 g. of Galog were given in two divided doses upto 35 days. Later Leptaden, Kalzol and Vimeral were discontinued and Galog was continued at the dose rate of 30 g. twice daily.

The animal was prepared for milking from third day of first injection. Milking was done morning and evening.

Results and Observation

Water discharge was obtained on first day and milking started from the fifth day. On the 10th. day about 500 ml. of rice gruel type of fluid came out. From the 11th day about 500 ml. of very thin white discharge was obtained. On the 14th day turned into milk of good quality. The quantity of milk thus obtained continued to increase at the rate of 400 ml. to 500 ml. per day till it reached a peak of 7 Litres per day.

Any way this type of successful artificial induction of lactation may solve the problem of sterility and infertility in Nepal.

Financial Statement of NVA

(From August 1990 to November 1992)

Income

Membership substription and renewal	Rs. 48,392.00
Building fund collection	Rs. 1,680.00
Bulletin and Directory sale	Rs. 5,606.00
Practitioner registration crtificates	Rs. 3,100.00
Bank interest, conference organization and collection	Rs. 1,35,308.36
Total	Rs. 1,94,086.36

Expenditure

Office secretary salary, painter etc.	Rs. 8,600.00
Postage and stationary	Rs. 1,160.00
Party and meeting	Rs. 2,245.00
Talk programme and advertisement	Rs. 550.00
Printing and directory publication	Rs. 15,466.00
Blood donation and photo	Rs. 720.00
Conference expenditure	Rs. 64,649.00
Total expenditure	Rs. 93,390.50

Balance Sheed as at November 1992

Balance as at

Aug. 1990	Rs. 1,11,491.45
Surplus upto Nov. 1992	Rs. 1,00,695.86
Total	Rs. 2,12,187.31

Statement of Balance

Fixed Deposite at Nepal Bank Ltd.	Rs. 35,000.00
Saving deposite	Rs. 1,77,187.31
Nepal Bank Ltd.	Rs. 1,22,492.20
NABIL Bank Ltd.	Rs. 54,695.11
Total	Rs. 2,12,187.31

Dr. K. Bhattarai

Treasurer, NVA

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Professional News

- Dr. D.D. Joshi has been appointed by HMGN in the post of Executive Director of the National Dairy Development Board (NDDB/DANIDA).
- HMGN has directed Tribhuvan University to start the Veterinary Science Program in IAAS, Rampur Chitwan.
- All existing seven departments under the Ministry of Agriculture have been merged into one the Department of Agriculture headed by Dr. U. Singh as Act. Director General.

PROMOTION

HMG promoted Dr. P.M.S. Pradhan and Dr. I Pathak to Chief Veterinary Officer (Gazetted 1st class) and Under Secretary (Gaz. II class) level respectively.

HIGHER EDUCATION

Dr. A. Pradhan, Dr. S. Singh, Dr. K.C. Thakuri and Dr. K.B. Bohora and Dr. U.M. Singh returned back to their respective job after completion of Their Master Degree in abroad.

NEW VETERINARIANS

Dr. Doj Raj Khanal, Dr. Swoyam Prakash Shrestha, Dr. Hemanta Kumar Shrestha, Dr. Boda Nath Adhikari, Dr. Bimal Kumar Nirmal, Dr. Ramjee Prasad Ghimire, Dr. Tanak Prasad prasai, Dr. Bed Prakash Bhatta, Dr. A.K. Chalise, Dr. Bahadur Shah Kunwar, Dr. Man Bahadur Pun, Dr. Ashok Kumar Singh, Dr. Hom Bahadur Basnet, Dr. Anil Regmi and Dr. Punel returned back to the country after completion of their Bachelors Degree in Veterinary Science in abroad.

Nepal Veterinary Association Heartly congratulates all the successors and welcomes the new fellow professionals.

LIFE MEMBERS OF NVA (Continued from Bull. Vet. Sc. & AH, No. 17-18)

83. Dr. Til Chandra Bhattarai	84. Dr. Mohan Dev Lakhe
85. Dr. Mahesh Raj Bista	86. Dr. Surendra P. Yadav
87. Dr. Tej Narayan Yadav	88. Dr. Kunjan P. Acharya
89. Dr. H.C. Karki	90. Dr. Arun Kumar Pandey
91. Dr. Damayanti Shrestha	92. Dr. Lindeck Marlis
93. Dr. Baronet Dominique	94. Dr. D. R. Ratala
95. Dr. Shyam Kishor Shah.	96. Dr. Mahendra Nath Lohani
97. Dr. Christina Rosenius USA	98. Dr. Eryl Hugh Pitt USA
99. Dr. Jap Narayan Bd. Shrestha	100. Dr. Sarah Heppn Stall, England

NVA Notice

- NVA earnestly requests our contributors to donate generously towards the building fund for the construction of its office building.
- All the members of NVA and the new Veterinarians are requested to register and renew their membership, to clear their dues and also to contribute Rs. 20.00 per year in order to renew the membership of World Veterinary Association.
- NVA has already introduced the system of professional registration for Veterinary practice in Nepal. Therefore, all the Veterinarians are hereby requested for the registration.
- NVA is going to publish a quarterly magazine entitled "Vetnary Chaumasic" in Nepali Language with an objective of dissemination of technological informations of Veterinary Science required to farmers. Therefore NVA request to authors to send there articles for publications.

TALK PROGRAMS

Some of the Talk Programmes organized by NVA incline:-

- Epidemiology of Rinderpest by Prof. Dr. R.P. Bansal, Chief IVRI Mukteswor, India.
- Reproductive Diseases by Shim Varod from Israel, March 92.
- Role of Heifer Project Integration in alleviating poverty in rural Asia and South Pacific region by Dr. R.K. Pelant, program Director for Asia/South Pacific Staff Veterinarian.

Recommendations of the Third National Veterinary Conference (10-12 Aug., 1990)

नेपाल भेटरिनरि एसोसिएसनको तेश्रो राष्ट्रिय सम्मेलनबाट पारित प्रस्तावहरू

नेपाल भेटरिनरि एसोसिएसनको तेश्रो राष्ट्रिय सम्मेलन २०४७ साल श्रावण २६ देखि २८ सम्म भव्यता पूर्वक सम्पन्न भयो । नेपालमा सरकारी तथा गैर सरकारी क्षेत्रमा कार्यरत ११५ जना सदस्यका साथै क्यानाडा, जर्मनी, डेनमार्क, अमेरिका ब्रिटेन र भारतका विभिन्न प्राविधिकहरूको सहभागितामा भएको उक्त सम्मेलनले वातावरण संरक्षण, नयां अनुसन्धान र प्रविधि सम्बन्धी प्रस्तुत गरिएका १५ वटा शोधपत्रहरू, पेशागत, विकाश हकहित र अन्य समसामायिक विषयहरूमा छलफल गरि निम्नानुसारको सूझाव तथा प्रस्तावहरू पारित गरेको छ ।

- १) नेपालमा भेटरिनरि क्याम्पस र भेटरिनरि अनुसन्धान केन्द्रको व्यवस्था हुनु पर्ने
 - क) नेपालमा भेटरिनरि डाक्टरहरूको कमि तथा आवश्यकता महसुश गरि त्रिभुवन विश्वविद्यालयले १५-२० बर्ष अगाडि परिकल्पना गरेको पशु चिकित्सा अध्ययन संस्थान अहिले सम्म पनि यथार्थमा परिणत नभएको र कुनै बढि आर्थिक बोझ विना हाल त्रिभुवन विश्वविद्यालय अन्तरगत रामपुर क्याम्पसमा भईरहेको पढाई सुविधामा केहि मात्र थप सुविधाको व्यवस्था हुन गएमा पशु चिकित्सा तथा पशु पालन सम्बन्धी जुनसुकै कार्य गर्न सक्ने छाख कअ ७ बज डिग्री स्नातक देश भित्र नै उत्पादन गर्न सक्ने भएकोले नेपालमा नै भेटरिनरि क्याम्पसको यथाशिघ्र स्थापना गर्ने जोडदार माग गरेको छ ।
 - ख) देशको आवश्यकता तथा माग अनुसार भेटरिनरि सेवालाई बढी सक्षम र भौगोलिक माग अनुकुल बनाउन नेपालमा सुदृढ र सुसंगठित भेटरिनरि अनुसन्धान केन्द्रको व्यवस्था हुनु पर्ने ।
- २) नेपालमा भेटरिनरि काउन्सीलको स्थापना र भेटरिनरि सेवा सम्बन्धी कानूनको व्यवस्था हुनु पर्ने
 - क) नेपाल अधिराज्यमा भेटरिनरि डाक्टरहरूको योग्यतालाई व्यवस्थित गर्ने र आधुनिक औषधिको बैज्ञानिक ढंगले प्रयोग गर्न एवं योग्यता पुगेका भेटरिनरि डाक्टरहरूको

रजिष्ट्रेशनको व्यवस्था समेत गर्न नेपाल भेटेरिनरि काउन्सीलनको गठन र सो सम्बन्धी ऐनको व्यवस्था हुनु पर्ने ।

- ख) नेपालमा विक्री वितरण भईरहेको पशुजन्य पदार्थहरू जस्तै मासु, दुध, फुल, माछा आदिको निरिक्षण र यसबाट मानिस वा पशुमा फैलिन सक्ने रोगहरूको नियन्त्रण सम्बन्धी कानुनको व्यवस्था हुनु पर्ने । पशु जन्य पदार्थ र पशु आहाराहरूको गुणस्तर परिक्षण नियमित रूपमा विषय विशेषज्ञ मार्फत गराई सधै उच्च गुणस्तर कायम गर्न कानुनी व्यवस्थाहुनु पर्ने ।
 - ग) नेपालमा भेटेरिनरि सम्बन्धी औषधि उत्पादन, विक्री वितरण, निकाशी-पैठारी एवं गुणस्तर निर्धारण सम्बन्धी छुट्टै कानुन बनाउनु पर्ने र यस्तो कार्यको नियन्त्रण सम्बन्धीत विषय विशेषज्ञद्वारा मात्र हुनु पर्ने साथै निश्चित औषधिहरूको सूचि छट्याई योग्यता नपुगेका व्यक्तीहरूबाट अनियन्त्रीत प्रयोग गर्नबाट रोक लगाइनु पर्ने ।
 - घ) पशु विमा : नेपालमा हालै मात्र संचालित पशुधन विमा कार्य व्यापक बनाइनु पर्ने र छिमेकी राष्ट्रहरूको अनुभवको आधारमा कृषक तथा विमा संस्थान दुवैलाई फाईदा हुने गरी दक्ष प्राविधिज्ञहरूको सेवा प्रयोग गरी बढि प्रभावकारी रूपमा संचालन गरिनु पर्ने ।
- ३) भेटेरिनरि डाक्टरहरूको बृत्ति विकास र उच्च स्तरीय सेवा प्रदान गर्न निम्न अनुसाको सुविधा उपलब्ध गराउनु पर्ने :
- क) खतरनाक वन्य जन्तु तथा पशुपंक्षीहरूबाट सर्न सक्ने जोखिम तथा धातक रोगहरूको संसर्गमा आउने पशु चिकित्सकहरूलाई रिस्क एलाउन्स र प्रयोगशाला, प्रशासनिक कार्य आदिमा संलग्न पशु चिकित्सकहरूलाई ननप्राक्टीसिंग एलाउन्सको व्यवस्था हुनुका साथै जिवन बीमाको व्यवस्था हुनु पर्ने ।
 - ख) त्रिभुवन विश्व विद्यालय अन्तरगत संचालित समान कार्य र शिक्षण पेशामा संलग्न भेटेरिनरियनहरूले पनि शिक्षण अस्पतालमा कार्यरत डाक्टरहरूले पाएको सुविधा सरह सुविधा पाउनु पर्ने ।
 - ग) देशमा भेटेरिनरि डाक्टरहरूको अभाव तथा विभिन्न जिल्लाहरूमा पदहरू रिक्त भए तापनि विदेशबाट उच्च शिक्षा हासिल गरि फर्केका कतिपय डाक्टरहरू बेरोगजार र अस्थायी रूपमा कार्यरत छन् तसर्थ रोजगारी तथा पदपूर्तिको व्यवस्था तुरुन्त गरिनु पर्ने ।
 - घ) यसरी उच्च शिक्षा प्राप्त दक्ष भेटेरिनरियनहरू बेरोगजार रहेको अवस्थामा पनि योग्यता प्राप्त नभएका व्यक्तीहरूलाई कतिपय जिल्लाहरूमा कार्यालय प्रमुख समेत दिइएको छ तसर्थ यसबाट हुन गएको नैरास्यताको बातावरण तुरुन्त हटाई श्री ५ को सरकारले ति

पदहरू स्थायी रूपमा पूर्ति गर्नु पर्दछ र सेवारत डाक्टरहरूको पदोन्नति र उच्च शिक्षा अध्ययनको व्यवस्था गर्नु पर्दछ ।

ड) केही समय पहिले पशु सेवा बिभाग अन्तरगत कार्यरत अस्थायी डाक्टरहरूलाई अवकास दिएको र दुग्ध विकास संस्थानको महाप्रबन्धक पदमा असम्बन्धित क्षेत्रको व्यक्तीलाई नियुक्ती गरेकोमा खेद प्रकट गर्दछ र अवकास प्राप्त साथीहरूलाई नोकरी अवधि जोडिने गरि तुरुन्त पुनःवहाली गरिनु पर्ने र यस पेशा संग सम्बन्धित श्री ५ को सरका र संस्थाहरूको विभिन्न उच्च ओहदामा सम्बन्धित दक्ष प्राविधिकलाई नै नियमानुसार नियुक्ती गरिनु पर्ने माग राखेको छ ।

४) नेपालमा भेटेरिनरि सेवा सम्बन्धी वर्तमान व्यवस्थामा निम्नानुसार सुधार गरिनु पर्दछ

क) पशु सेवा बिभाग तथा अन्य संस्था अन्तरगत कार्य गर्ने कर्मचारीहरूको हाल भइरहेको पदको नामाकन निम्न अनुसार परिवर्तन गरि कायम हुनु पर्दछ :

हालको पद	हुनु पर्ने
<u>अधिकृत स्तर</u>	
सहायक पशु चिकित्सक	भेटेरिनरि अधिकृत
पशु चिकित्सक	वरिष्ठ भेटेरिनरि अधिकृत
प्रमुख पशु चिकित्सक	प्रमुख भेटेरिनरि अधिकृत
<u>सहायक स्तर</u>	
प्राविधिक सहायक	भेटेरिनरि सहायक
नायब प्राविधिक सहायक	भेटेरिनरि उप सहायक
क्षेत्र सहायक	भेटेरिनरि स्टक मेन

ख) हाल भई रहेका सहायक सचिव को पद खारेज हुनु पर्दछ ।

ग) जिल्ला जिल्लामा रहेका साविक भेटेरिनरि हस्पिटलहरूको नामाकन पशु सेवा शाखा नभई भेटेरिनरि हस्पीटल नै हुनु पर्ने ।

घ) हाल कृषि सेवा अन्तरगत भेटेरिनरि समूह भई रहेकोमा अब उप्रान्त निम्न अनुसारका समूह र उप समूहहरूको गठन हुनु पर्ने सुझाव पेश गरेको छ ।

क) पशु स्वास्थ्य समूह

१) भेटेरिनरि उप-समूह

२) पारा भेटेरिनरि उप-समूह

ख) पशु स्वास्थ्य प्रयोगशाला समूह

- १) अनुसन्धान, उत्पादन उप-समूह
- २) प्रयोगशाला प्राविधिक उप-समूह

- ५) कृत्रिम गर्भाधानको कार्य बढी जटिल भएकोले प्रजनन मात्र नभई पशु प्रजनन स्वास्थ्य सम्बन्धी बढी ज्ञान भएका भेटेरिनरि डाक्टरहरूलाई सरीक गराउन श्री ५ को सरकारलाई अनुरोध गरेको छ ।
- ६) राष्ट्रिय निकुन्ज तथा वन्य जन्तु संरक्षण बिभाग अन्तरगतको संरक्षण अधिकृत (वार्डेन) पदमा भेटेरिनरि स्नातक वा सो सरहले सेवा प्रवेश पाउने व्यवस्था हुनु पर्ने ।
- ७) यस एसोसिएसनको पहिलो र दोश्रो राष्ट्रिय सम्मेलनहरूबाट पारित प्रस्ताव तथा सुझावहरूको कार्यान्वयनको लागि सम्बन्धित निकायको ध्यान जानेछ भन्ने पूर्ण विश्वास लिएको छ । साथै यस तेस्रो राष्ट्रिय भेटेरिनरि सम्मेलनबाट पारित प्रस्ताव तथा सुझावहरूको यथासिद्ध कार्यान्वयनको लागि सम्बन्धित निकायहरू संग यस नेपाल भेटेरिनरि एसोसिएसन जोडदार माग गर्दछ ।