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GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE
(DEPARTMENT OF ANIMAL HUSBANDRY & DAIRYING)
Krsihi Bhawan, New Delhi-110001

D.O.No: 1-1/92-AHC
Dated : 28th May, 1993

My dear Sh. Unni,

I was extremely thrilled to receive your Blue Cross Book for a very hurried volume, You deserve my congratulations. I will be glad to be the patron of the journal in order to spread the good work to my veterinary colleagues.

With kind regards,

Yours sincerely,

(P.N.BHAT)

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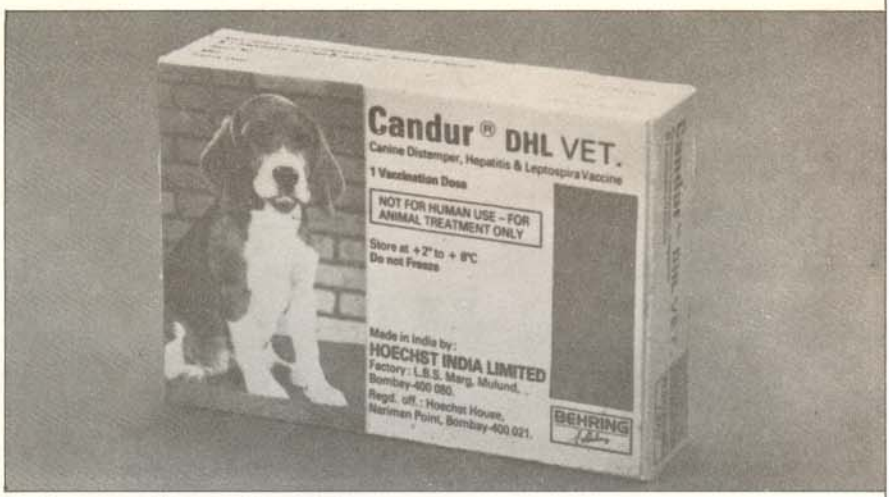

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TRIBUTE TO A GREAT SCIENTIST

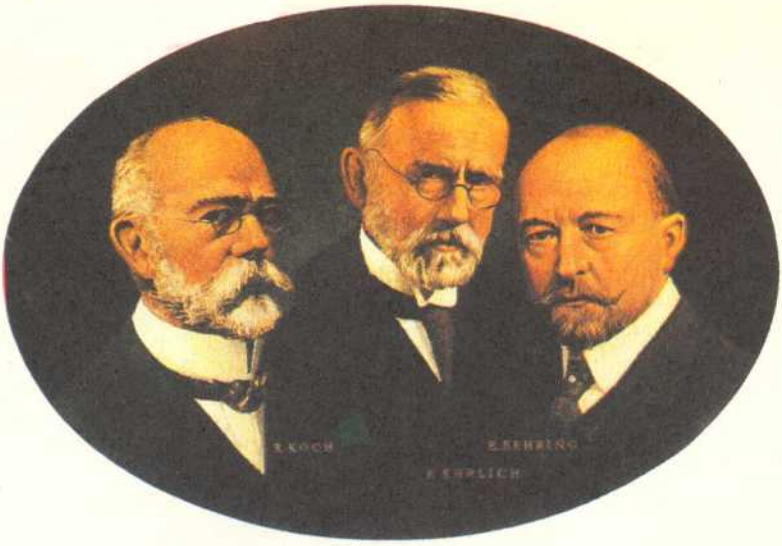
Emil von Behring

an important scientist for the development of vaccines

Emil von Behring was born in 1954, son of a teacher in Hansdorf/WestpreuBen. He grew up in the simple surroundings of a village and only his early studiousness and his friendly helpful manner permitted him to attend a college and the university, where he could study medicine. In critical situations he always found sponsors and acceptance. On the other hand he credited this ability in his personal achievement to steady efforts and workoholic attitude.

For every semester of studies he had to work for one year in the army, so he quit his service in 1894, at the age of forty. During this time he was confronted with the important epidemic problems of his age. The problems of this time were comparable to those we find nowadays in the third world - lack of hygiene, superstitious imaginations, increasing population and also absence of effective therapies.

As a student he experienced the pox epidemic of 1873, when in the " German Reich " 400 000 fell sick of which 181 000 died. Similarly every year 40 000 to 70 000 children died of diphtheria. These epidemics were even more cruel in times of war and distress. In addition pestilence, cholera, spotted fever and others were feared. Towards the ending of the 19th century, new knowledge of medicine, hygiene and social hygiene brought some changes.



In his scientific pursuit he became associated with three other eminent German scientists of the time, viz.

1. Rudolph Virehow (1821-1902), the father of Cellular Pathology.
2. Robert Koch (1843-1910), Director of Institute of Hygiene, Berlin, who identified the germs causing tuberculosis and cholera. He received the Nobel Prize in 1905 for his outstanding work.
3. Paul Ehrlich (1854-1917), the father of Chemical Therapy; who successfully used salvarsan against syphillis and was the winner of the Nobel Prize in 1908.

Emil von Behring himself became the first recipient of Nobel Prize for medicine & physiology in 1901 for his monumental work of developing the Diphtheria-serum therapy.

It was like a ray of hope to save a lot of children worldwide from this disease. It was linked with the name BEHRING and the town MARBURG at the river Lahn. It was not an ordinary medicine, but was aimed at the causal problem by giving immunosera or immunglobulines, which are still nowadays not replaceable by chemical and antibiotic therapies. A very new principle, the phenomenon of immunization was discovered, the principle of formation of specific antibodies. But still in spite of the success he emphasized the active vaccination as the better way. Also the use of homologous serums, (serum from man for man) was already in his mind. Many new ideas were then to be realised. His tenacity he established from his philosophical, humanistic background : the aim of his life was to save the men from those diseases, where there was no help available. Behring's priority therefore was to start as early as five o'clock with his work, doing it with highest concentration putting it in the centre of his life. For criticism and discussion he was always ready in the hope to improve his results.

In 1904 he founded the Behringwerke in Marbach Closeato, Marburg.

He died of pneumonia in 1917.

Humanity owes its gratitude to Emil von Behring.

THE EFFECT OF PANACUR (FENBENDAZOLE) TREATMENT ON LACTATION YIELD IN DAIRY COWS.

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and K.A.Mujumdar [Hoechst India, Bombay]

Subclinical parasitism which is caused by low grade infection of parasites, their tissue stages or both, appears to be of common occurrence in India. (Jagannath et al. 1988 and Sanyal et al., 1992) and other countries (Borgsteede and Van den Burg, 1982 and Vercruysse et al., 1986).

Since the animals have a subclinical parasitic infection they do not exhibit symptoms and the stool examination is invariably negative, it is difficult to estimate the exact incidence of such infection in a herd or in a geographical region.

The adverse effects of subclinical parasitism on growth and production of animals was shown for the first time in 1972 by Todd et al., who reported that dosing with phenothiazine increased the milk yield of animals which were clinically normal and negative on stool examination. Subsequently many workers have conducted trials involving large herds of animals using different anthelmintics (viz. Thiabendazole, Fenbendazole, Oxfenbendazole, Albendazole) at different stages of reproductive cycles of the host and have reported varying degrees of increase in milk yield, milk fat and milk protein in treated animals as compared to the controls. The literature in this respect is quite exhaustive and some important and representative information is summarised in Table-I.

MATERIALS AND METHODS

The trial was conducted on 27 Gir, HF cross bred animals of unit no. 5, Aarey Milk Colony, Bombay. The animals under study were all apparently normal and did not reveal any clinical symptoms of helminthiasis. Ten of these animals were pregnant cows (Group B-second lactation).

Group A was further divided into two sub-groups of 5 animals each. One was treated with Panacur while the other was untreated control.

The treatment involved oral administration of Panacur (Fenbendazole) (3 gm/300 kg body weight) at four different times as below :-

1) 15 days before calving
2) 15 days after calving
3) 45 days after calving
5) 75 days after calving

The stool samples of all animals in the herd were examined before the trials to estimate the parasitic burden in the herd. The daily milk yield was separately recorded from the day of parturation till 90 days of lactation.

RESULTS

Faecal examination

In the herd from which animals for trials were selected the initial examination of faecal

samples revealed that 14% animals were positive for Strongyle worms. The infection however was very low and hence eggs per gramme (EPG) could not be calculated.

The monthly faecal sample examination of animals under trial during the next three months showed that the treated cows were negative whereas, in control animals occasionally few positive cases with very low intensity were detected.

Milk Yield

The milk yield of animals in first lactation (Group-A) is given in Table-II. The treated animals in this group yielded 0.691 kg milk/day/cow more than the control animals. The increase was 7.15%.

In group-B i.e. cows in second lactation (Table-III) the treated animals produced 1.029 kg milk/day/cow more than the controls and the increase in the milk yields was 10.29%.

In case of animals of Group-B the data on the milk yield in first lactation was available in respect of 9 treated and 5 control animals. The comparison of average milk yield in first and second lactation of these animals (Table-IV) shows that in the treated animals the increase in yield from first to second lactation was 3.144 kg/day/cow (39.91%) while in controls it was only 1.376 kg/day/cow (18.15%). Thus there was additional increase of 21.76% in treated animals in second lactation as compared to the first lactation. (Fig.1 & 2).

DISCUSSION

The herd in which the present trials were conducted, was having a subclinical parasitic infection of strongyle worms as revealed by the stool examination. Thus, this was a model situation to test the efficacy of Panacur on subclinical strongyle worm infection and also to test indirectly the effect of such treatment on production.

The observations noted here indicate a substantial increase in milk production in subsequent lactation after the regimen of Panacur dosing. In this respect the findings are in agreement with those of other authors mentioned in Table-I.

The literature reveals that while there is a wide variation in the quantum of increase due to anthelmintic dosing reported by different authors, few (Barger and Lisle, 1982; O'Farrell et al., 1986) have even reported no effect at all on production. This indicates that the degree of adverse effects of subclinical parasitism on production depends on several factors viz. species of parasite, degree of infection, stage of hypobiosis, reproductive stage of animal, general nutritional level, season etc.

Strongyle worms and their parasitic larvae, being more pathogenic, affect the production to a greater extent than other parasites. Amongst the Strongyle group, Haemonchus sp. has adverse effect on milk production to a greater extent (Spence et al., 1992).

The parasitic larval stage of strongyle worms, in general, are hypobiotic in winter and undergo resumption as spring approaches. The resumption of hypobiotic larvae also takes place during periparturient period because of relaxation of immunity and action of prolactin as stated by Kelly (1973).

In bovines, since winter is also the calving season, there is large scale resumption of hypobiotic larvae during this time. The resumed larvae being pathogenic exert greater stress, the effect of which persists longer, extending upto subsequent lactation and reducing the milk yield.

The timing of anthelmintic dosing for milk production has therefore to be coincided with the time of calving in pregnant animals and

winter in others. This is also because the resumed larvae are vulnerable for treatment because of their higher metabolic rate and hence greater uptake of drug than in hypobiotic stage. This conclusion is supported by the observations of Pouplard (1978), McBeath et al. (1979), Bisset et al. (1987) and Sanyal et al. (1992) etc. who have used anthelmintic at the time of calving to get better production as has also been observed in this study.

Benzimidazoles in general appear to be better drugs for use in subclinical parasitism. Metabolic products (sulphoxides and sulphones) of these drugs exert anthelmintic action on larval stages of strongyle worms while being recycled to gastrointestinal mucosa through blood circulation. Among these, fenbendazole (Panacur) appears to be the better because of low residues in milk and practically nil withdrawal period (Becker 1976).

SUMMARY

The trials involving treatment of pregnant cross bred cows having subclinical parasitic infections, with Panacur (fenbendazole) periparturiently, revealed a substantial increase in milk yield. In animals, in first lactation and second lactation, there was increase of 7.15% and 10.29% repectively in milk yield of treated animals as compared to the controls. Increase of yield in second lactation as compared to that in first lactation was higher (39.91%) in treatment group than in controls (18.15%).

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Table I : Literature regarding effect of anthelmintic treatment on increase in milk production

Sr.No.	Year	Author	Anthelmintic	Timing of anthelmintic dosing	Increase in production in next lactation		
					Milk yield	Milk fat	Milk protein
1	1972	Todd et al.	Phenothiazine	-	increase in milk yield	-	-
2	1974	Bliss & Todd	Thiabendazole	at calving	increase in milk yield	-	-
3	1978	L. Pouplard	Thiabendazole	at calving	399 kg cows 1074 heifers	13 kg cows 37 kg cows	-
4	1979	Pleumiers E.J.	Thiabendazole	-	increase in milk yield	-	-
5	1979	McBeath et al.	Fenbendazole	at calving	173 kg cows 526 kg heifers	-	-
6	1979	Myers	Fenbendazole	at calving	300 kg	-	-
7	1980	Hammann and Heeschen	Fenbendazole and Thiabendazole	-	3.4%	7.8%	-
8	1981	Grzywinski et al. Heeschen	Fenbendazole and Thiabendazole	one week before calving and one week after calving	milk yield increase (305 days lactation)	-	-
9	1982	Michel et al.	Anthelmintic	calving	42 kg (305 days lactation)	1.8 kg	-
10	1983	Mathews et al.	Fenbendazole	second day after calving and then twice weekly	7.7% (20 weeks lactation)	2.5%	9.9%
11	1987	Bisset et al.	Oxfendazole	two weeks before and two weeks after calving	51.5 litre (251 days lactation)	2.24 kg	-
12	1990	Ploeger et al	Albendazole	before calving	132.9 kg (100 days lactation)	-	-
13	1992	Sanyal et al	Fenbendazole	periparturient period	11.2% (60 days lactation)	-	-

- indicates information not available

Table II : Average and total milk production of Panacur treated and control cows in First lactation (Group A)

Sr.No.	Panacur treated group			Control Group			Difference in milk yield		
	Cow no.	Total milk in 90 days (kg)	Average milk per day (kg)	Cow no.	Total milk yield in 90 days (kg)	Average milk per day (kg)	Total milk yield in 90 days (kg)	Average milk per day (kg)	% of increase
1	7953	1180	13.110	8012	717	7.966			
2	5085	763	8.478	7901	424	4.711			
3	5162	667	7.411	7940	1098	12.200			
4	8060	867	9.633	7669	1078	11.977			
5	5278	1180	13.111	8079	8079	11.433			
	Average	931.4	10.348		869.2	9.657	+ 62.2	+ 0.691	7.15

Table III : Average and total milk production of Panacur treated and control cows in Second lactation (Group A)

Sr.No.	Panacur treated group			Control Group			Difference in milk yield		
	Cow no.	Total milk in yield 90 days(kg)	Average milk per day (kg)	Cow no.	Total milk yield in 90 days (kg)	Average milk per day (kg)	Total milk yield in 90 days (kg)	Average milk per day (kg)	% of increase
1	4394	1178	13.110	7427	57	6.522			
2	7655	722	8.022	4652	919	10.211			
3	4211	1175	13.055	8039	784	8.711			
4	4827	1162	12.911	7117	631	7.011			
5	4898	919	10.211	4939	1234	13.711			
6	7149	1038	11.533	5062	1158	12.866			
7	4805	545	6.055	7675	1146	12.733			
8	7526	1230	13.666	7622	735	8.167			
9	4908	958	10.644	-	-	-			
	Average	991.889	11.021		889.25	9.992	+ 102.639	+ 1.029	10.29

Table IV : Comparison of first and second lactationmilk yield in panacur treated and control groups of cows

Sr.No.	Panacur treated group				Control Group			
	Cow No.	Avg. daily yield in I lactation (kg)	Avg. daily yield in II lactation (kg)	Difference per cow (kg)	Cow No.	Avg. daily yield in I lactation (kg)	Avg. daily yield in II lactation (kg)	Difference per cow
1	4908	7.422	10.644	+3.222	7427	6.480	6.522	+0.042
2	7655	4.970	8.022	+3.052	4652	7.560	10.211	+2.651
3	4394	8.130	13.088	+4.958	7117	7.080	7.011	+0.069
4	4211	9.680	13.055	+3.375	7675	9.620	12.773	+3.113
5	4827	8.400	12.911	+4.511	7622	7.160	8.166	+1.006
6	4898	5.400	10.211	+4.811				
7	7149	9.080	11.533	+2.453				
8	4805	7.110	6.055	-1.055				
9	7526	16.700	13.666	+2.966				
Average		7.877	11.020	+3.144		7.58	8.928	+1.376

Fig. 1 Average milk yields in cows

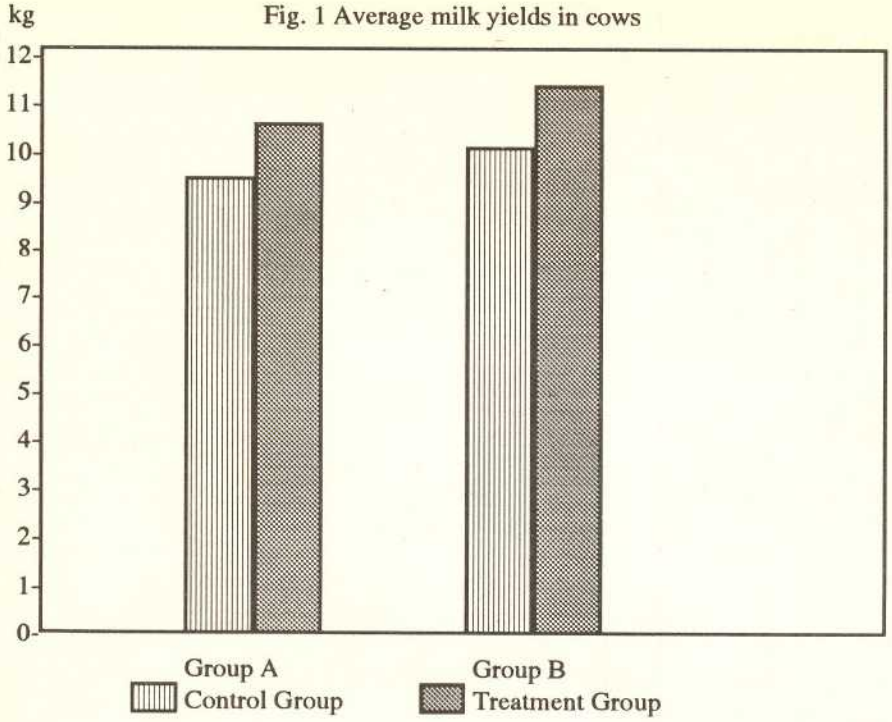
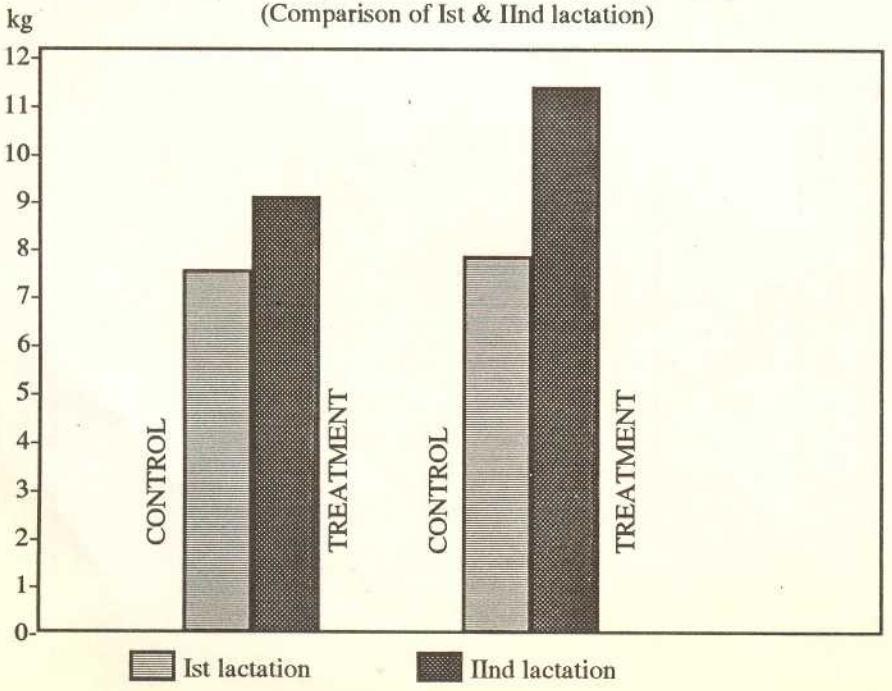


Fig. 2 Average milk yields in cows (Group A & B)
(Comparison of Ist & IInd lactation)



IN-VITRO STUDY ON EFFICACY OF DELTAMETHRIN (BUTOX) AGAINST EGG LAYING CAPACITY OF SOFT TICKS *(Ornithodoros spp.)*

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INTRODUCTION :

Soft ticks (O.Cariaceus and O.Sauignyi) are found in the semiarid zone specially on the sandy ground or slightly below the ground level which is covered by trees. These ticks remain on the body of the host for a short period. However, economic losses are likely to occur due to discomfort, irritation and toxicosis, on account of tick bite. The paralysis and death of animal have also been observed (Fraser 1986). Deltamethrin in the form of spray directly on the body of the host has been tried successfully to control different ectoparasites of cattle (Banerjee and Sangwani, 1990; Gupta et al., 1984); sheep and goat (Sharma et al, 199 a); camel (Pathak et al., 1991) and dog (Sharma et al., 1991b). Probably, there does not seem to be any report on efficacy of Butox to control these parasites while preparing for egg laying. Therefore, the present study was undertaken to assess the effective concentration of Butox to check the egg laying capacity of soft ticks, as control of these ticks on the body of host is rather difficult since they parasitize on host only for a short period.

MATERIALS AND METHODS :

A total of 120 engorged soft ticks were collected from the field and cleaned with the help of soft brush.

They were divided into treatment (Group-I-V) and control (Group-VI) groups, each consisting of 20 ticks. The ticks of the former groups were dipped in different concentrations of Deltamethrin (Butox, Hoechst India Ltd., Bombay) for 5 seconds.

The ticks of the control group were dipped in distilled water for 5 seconds. After dipping, the ticks were placed on the filter paper for drying and subsequently transferred to individual test tube to assess the egg laying capacity over a period of two months incubation at 37°C temperature in B.O.D. incubator. The presence of eggs if any, in these tubes was confirmed at 48 hr. intervals throughout the incubation period.

RESULTS :

Table shows the egg laying capacity of ticks in each treatment group against the different concentrations of Deltamethrin. In group-I, 6 ticks (30%) out of total 20 ticks laid the eggs against the Deltamethrin concentration of 4.687 ppm, whereas, not a single tick laid eggs against concentrations of 9.375, 18.75, 37.50 and 75.00 ppm in remaining groups II-V, respectively. Death of all ticks was also recorded in these treatment groups. On the other hand, 19 ticks (95%) laid eggs in the control group.

Table 1 : Egg laying capacity of soft ticks against different concentrations of Deltamethrin.

Treatment groups	No. of ticks	Concentration of Deltamethrin(ppm)	No. of ticks laid eggs
I	20	4.687	6 (30)
II	20	9.375	-
III	20	18.75	-
IV	20	37.50	-
V	20	75.00	-
VI (Control)	20	Distilled water	19 (95)

Figures in parentheses denote percentage

DISCUSSION :

It is evident from the results that Deltamethrin 4.687 ppm conc. was partially effective to check the egg laying capacity while, concentrations of 9.375 and above destroyed, the egg laying capacity completely apart from death of these ticks. In vitro trials conducted against hard ticks have shown that Butox in the concentrations of 25 ppm is quite effective (Banerjee and Sangwani, 1990 and Gupta et al., 1984). The in vitro concentrations of Butox found effective against soft ticks was understandably low compared to reported concentration effective against hard ticks.

SUMMARY :

Deltamethrin (Butox) in the concentration of 9.375 ppm and above was found effective to check the egg laying capacity as well as to kill soft ticks in vitro.

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A CLINICAL TRIAL ON DELTAMETHRIN (BUTOX) AGAINST SARCOPTIC MANGE IN CAMELS

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Male camels in Northern Gujarat of India play an important role in transportation of agricultural products and some of the essential market commodities. But the working efficiency of these camels is drastically reduced by the infection caused by Sarcoptes scabiei var cameli. Though sporadic cases of this infection do appear throughout the year, it reaches the peak, (32.13 percent) during the winter (Rathore and Lodha, 1973 and Abdullah et al., 1988). The parasites pierce the skin to suck the lymph and may also feed on young epidermal cells. The activities of parasite produce marked irritation which leads to itching, scratching and inflammation of skin. In the later stage, crust formation, thickening and wrinkling of the skin are noted.

Several local medicinal applications such as Lindane, Benzyl benzoate, BHC and Tetramethyl thiaaminosulphate, etc. are being used to treat the mange, but the results are not satisfactory.

Butox (Hoechst), a new synthetic pyrethrin (Deltamethrin) insecticide, has been found to be very effective in the treatment of mange in various species of animals (Mandal and Singh, 1984). However, there are no reports of its use in camels. Hence, the present study was undertaken to find out the effectiveness of Butox in camel mange under the normal field conditions.

MATERIALS AND METHODS

About 68 camels were checked and out of them, 27 with various levels of infection with Sarcoptic mange were selected for the present investigation. They were divided into 4 main groups according to the degree of infection :

Group I : Severe infection (Almost the whole body skin was hairless, thick and wrinkled skin covered with crust and exudate).

Group II : Moderate infection (large patches of infection shedding of hair and black colouration of skin).

Group III : Mild infection (small patches on skin, partial shedding of hair and grey discolouration of the affected area).

Group IV : Control.

Each group contained eight animals but the group-IV contained only three animals one from each class of infection. Animals of group-I to group-III were sub-divided into two sub-groups A and B with four animals each (Animals of group-I to group-III) were treated with Butox solution containing 12.5 gm/l of Deltamethrin by spraying the drug on whole body with Sikar, Knapsack sprayer. Animals of each group were sprayed with a concentration of 4 ml/lit whereas those of

sub-group B were sprayed 8 ml/lit of Butox solution. Animals of control group were sprayed with tap water.

The treatment was repeated (given for one to three times) if necessary after an interval of 15 days when skin scrapings were collected a day before the treatment to confirm the presence of parasite by microscopic examination. No treatment was given when the skin scrapings became negative.

Negative skin scrapings and gradual disappearance of gross lesions were the criteria to assess the efficacy of the medication.

RESULTS

Fifteen days after the first spray a mild to moderate degree of improvement was seen in the treated animals. Animals of group-I showed about 25% recovery with less degree of itching and biting of skin. Animal of group-II showed a 60% improvement in the general condition and lesions, but in both the groups, skin scraping were found to be positive for parasite. Animals of group-III showed a significant improvement with no biting, scratching and skin started coming back to normal with scrapings negative for parasite. However, there was no significant difference between the sub-groups A and B showing that higher concentration did not give much advantage.

The second spray was given only to the animals of group-I and group-II which still showed persistence of infection. On the 30th day, there was a significant improvement in both these groups. Skin started coming back to normal, there was new growth of hairs and the skin scraping was found to be negative in group-II and group-III, but group-I still showed mild infection. All the animals of group-III were with normal skin and full growth of hair and it was difficult to make out the infected part of skin.

Third spray was given on 30th day only to group-I animals, which showed the positive skin scraping. On the 14th day, skin scraping of group-I also were negative and there was good improvement of skin. No further treatment was necessary. Animals of group-II and group-III were as good as normal with no sign of infection on any part of the body.

The condition of group-IV was worst. After the study, the control group animals were also given the treatment with 4 ml/lit concentration only. On the 60th day, the animals were examined for general improvement and it was observed that there was regrowth of hairs in some camels of group-I also.

DISCUSSIONS

The Butox brand of Deltamethrin has shown results in Sarcoptic mange in camels as expected. In mild infection, single application of the drug was adequate to eradicate the infection while in severe conditions 2 to 3 exposures were required 15 days apart. The treatment was tried at 2 concentrations, i.e. 4 ml/lit and 8 ml/lit. But it was found that higher concentration has no significant advantage over the low concentration. There is no report of effect of Deltamethrin in mange of camels. The observations in the present study are parallel to those of Mandal and Singh (1984, 1986) about the efficacy of Deltamethrin against mange in buffaloes.

CONCLUSION

Application of Deltamethrin 50% solution as a spray at the rate of 4 ml/lit in water

is effective in the treatment of Sarcoptic Scabiei var cameli infection in camels. Depending upon the severity, 2 to 3 applications at the interval of 15 days are necessary for a complete cure.

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COMPARATIVE EFFICACY OF OXYCLOZANIDE, NITROXYNIL, TRICLABENDAZOLE AND RAFOXANIDE IN OUTBREAKS OF FASCIOLIASIS IN SHEEP IN PUNJAB

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Fascioliasis in domesticated ruminants caused by Fasciola gigantica in Punjab and elsewhere is of great economic importance. In sheep and goat the disease occurs in acute outbreaks. However, in cattle and buffaloes it is mostly of chronic form but nevertheless outbreaks do occur (Ross et al., 1968).

Several fasciolicides have been reported to possess high efficacy against mature and immature forms of the parasite in goat (Wolf et al., 1983) in sheep (Turner et al., 1984; Owen, 1987; Misra et al, 1987; Gupta et al., 1989) in buffaloes (Misra et al., 1987, Gupta et al., 1989) and in cattle (Rapic et al., 1988, Richards et al., 1990) In this communication comparative efficacy of fasciolicides in seven outbreaks of fascioliasis in sheep in the Punjab is reported.

MATERIALS AND METHODS

Flocks of sheep which suffered from fascioliasis in different areas of Punjab are tabulated below :

Table 1

Year	Area	Number of animals	Month of occurrence	Animals died	Percent dead
1988	Hole (Ludhiana)	100	October	50	50
1989	Rohno (Ludhiana)	70	- do -	30	43
	Gobindgarh (Ludhiana)	40	November	30	7
1990	Jhanir (Ludhiana)	196	December	44	22
1991	Rohno (Ludhiana)	95	- do -	10	11
	Manami (Ludhiana)	105	- do -	5	4
1992	Mukatsar (Faridkot)	130	November	46	35
		736		188	26

Description of various anthelmintics used is given below :
Table 2

S.No.	Chemical	Trade Mark	No. of animals treated	Dose	Route of administration
1.	Nitroxynil	Trodax (M & B)	350	1.5 ml per 50kg.	S/C
2.	Oxyclozanide	Tolzan-F (Hoechst)	300	20 mg/kg.	Orally
3.	Triclabenda-zole	Fasinex (Ciba-Geigy)	10	10 mg/kg.	- do -
4.	Rafoxanide	Ranide (MSD)	35	7.5 mg/kg.	- do -

All the places of occurrence of outbreaks of fascioliasis were visited and animals examined; post-mortem of dead or dying animals was conducted and diagnosis confirmed as to the cause of death was fascioliasis. Faecal samples from sick animals were collected and eggs per gram (EPG) was done by McMaster Chamber. Blood samples from sheep were collected before and after treatment for haematology and biochemical analysis.

At each site within the flock, 5 sick animals were separated and kept as untreated controls. The remaining sick animals were treated with one anthelmintic at each flock site. Supportive therapy with Livogen 5 ml/a/m (3 injections) on alternate day was given at one flock site i.e., village Hole, district Ludhiana.

All the flocks were revisited after three weeks and fecal samples from the treated and untreated sheep were collected and screened for Fasciola eggs.

RESULTS AND DISCUSSION

It was observed that nitroxynil, oxyclozanide and triclabendazole provided 97, 98 & 99 percent clearance of egg production by Fasciola worms. It showed that these drugs killed all the adult worms. However, rafoxanide provided 70 percent protection against egg production which indicates that this drug was not completely effective in eliminating the adult worms. Further it was also observed that the former three drugs also affected the immature worms because within a period of three weeks the immature worms would have matured and produced eggs. Since the faeces of the treated animals rarely contained eggs, it can be concluded that the immature worms were also killed by these drugs. Analysis of blood revealed haemoglobin increased from 8.6 to 10.8 percent. The total protein content increased from 6.8 to 8.0 percent during the three week period of observation. It is also concluded that these drugs were safe and did not evoke any untoward reaction. All these flock owners were advised to administer these drugs prophylactically in the month of May and October. Following that the sheep given these medications did

not suffer from fascioliasis except in one block at Rahno, Ludhiana. It is evident that if the animals usually sent for grazing in the endemic areas are dosed with fasciolicides they can be protected from the malady. This is particularly affective in endemic areas fascioliasis. The control of snails in such areas cannot be over emphasized, but if prophylactic medication of fasciolicides and snail control are practised the disease could be contained if not eradicated.

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HORN CANCER IN INDIAN CATTLE - A REVIEW

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Horn Cancer (H.C.), a squamous cell carcinoma, is one of the most common neoplastic diseases affecting cattle all over the Indian sub-continent. It forms almost 52.0% of all malignant tumours found in Cattle (Chaudhari 1983). Hewlett (1905) was the first to report H.C. in aged working bullocks in Bombay and thereafter the disease was reported from many parts of our country. The H.C. has also been reported from few other countries like Indonesia, by Burggraaf (1935), Iraq by Zubaidy (1976), and in Brazil by Rezende and Neves (1936). Though the H.C. was reported in the early part of this century it still remains a major problem affecting the economy of our farmers and baffling the veterinary research workers to elucidate its etiology, site of origin, therapy and control of this malignant disease.

EPIDEMIOLOGY :

Epidemiological surveys of large number of cattle from different parts of Indian subcontinent have revealed that the neoplasm is widely prevalent in bullocks, significantly less in cows and is seldom noticed in bulls. The incidence was found more in purebred than in crossbred cattle (Naik and Randelia, 1978). Kulkarni (1953) reported 1414 cases of H.C. out of 1366350 cattle examined during 1947-1952 in Baroda, Gujarat State. Lall (1953) recorded 6,286 cases of H.C. in Meerut circle in U.P. Nair and Sastry (1954), when examined 2003 neoplasms in bovines, observed 465 (23.22%) of H.C. at the Pathology Department of Madras Veterinary College. Naik and Balakrishnan (1963) examined 122,800 cattle and 10,000 buffaloes during 1954-1956 at an abattoir in Bombay and observed 2064 (16.8/1000) cases of H.C. in cattle but none in bulls and buffaloes. Again Naik and Randelia (1978) examined 79492 cattle comprising of 78024 bullocks and 1468 bulls during 1967-1969 and detected 794 cases (9.99/1000) of H.C. (See Table) at the abattoir in Bombay and none in bulls except for a case of H.C. in a bilaterally cryptorchid 5 years old bull (Naik et al. 1970). Pachauri and Pathak (1969) have reported 1141 cases of H.C. in Uttar Pradesh. During the period 1940-1975, Damodaran et al. (1979) diagnosed 635 cases of H.C. of which 517 (81.4%) were in bullocks. 113 (17.8%) in cows and 3 (0.5%) in bulls and the remaining 2 were in he buffaloes. Thus the H.C. is mostly found in working bullocks, significantly less in cows and rarely in bulls and buffaloes.

The disease was found to occur in cattle between 5-12 years of age but the maximum incidence was noticed between 6-10 years by many epidemiologists. So the bullocks at their prime age of working suffer from H.C. and die, resulting in the economic loss to the farmers. Both the horns were found equally vulnerable and occasionally both horns

were found affected (Naik et al. 1969, Kulkarni 1953, Gupta and Sadana 1981).

The breed differences in the incidence rate was very conspicuous. The breeds of cattle which have long, thick and massive horns like Kankrej had the highest incidence)19/1000) followed by Gir, Khillari and Malvi (13/1000). The cattle belonging to Dangi breed and non-descript cattle with short and stumpy horns had low incidence of 9/1000 and 5.79/1000 respectively (Naik and Randelia 1978). The high incidence in purebred cattle and significantly low in nondescript cattle and finding of the bullocks with both the horns affected are suggestive of genetic predisposition and breed susceptibility. No seasonal variation in the prevalence of H.C. was noticed by any investigator.

ETIOLOGY :

The exact etiology of H.C. still remains obscure. Many factors of Physical, Chemical and Biological (Viral) have been reported by different investigators (Kulkarni, 1953; Lall, 1953; Naik et al., 1969; Heranjal et al., 1980 Somvanshi et al. 1983).

Trauma or injury to the horn by striking of the yoke while working, pairing of the horn, tying of the tethering rope tightly at the base of the horns to restrain the animal, have been strongly suspected. Since the site of origin of H.C. has been confirmed by Naik et al. (1988) as the m.m. lining the core cavity of the horn, which was suspected by Heranjal et al. (1980); it seems constant striking of the yoke to the horn might injure the

Table - 1

PREVALENCE OF HORN CANCER IN DIFFERENT CATTLE BREEDS

(NAIK AND RANDELIA 1978)

Breeds	Examined No.	Horn Affected				
		Right	Left	Both	Total	Prevalence per 1000
Amritmahal	372	1	1	-	2	5.40
Dangi	1905	9	9	-	18	9.45
Gir	1109	5	10	-	15	13.53
Kankrej	5689	60	53	-	113	19.86
Khillari	4881	33	30	-	63	13.00
Malvi	23066	147	166	3	316	13.70
Nimari	997	15	11	1	27	27.08
Nondescript	41473	105	133	2	240	5.79
Total	79492	375	413	6	794	9.99

m.m. and make it vulnerable to malignant growth. Sex hormones have been suspected since the incidence was significantly more in bullocks compared to cows and bulls, besides a H.C. was reported in a five year old bilaterally cryptorchid bull by Naik et al. (1970). Ishwad et al. (1988) who studied the hormonal levels of FSH, LH, testosterone and 17B-oestradiol in serum of 93 normal and 35 H.C. affected bullocks and 30 normal bulls of different breeds by RIA technique showed significant difference in the levels of all the hormones in the bulls and normal bullocks but there was no significant difference observed between normal controls and affected bullocks except for the 17B-oestradiol which was raised in the affected bullocks. Kalra and Kulshreshtha (1978) reported lower levels of testosterone and oestradiol in the H.C. affected bullocks when compared to normal controls. Whether these differences in the hormonal levels due to castration would act as high risk factors and predispose the bullocks to suffer from H.C. warrants further studies. Hormonal estimations in cows affected with H.C. might give better clues, if there are any role of male hormones predisposing the occurrence of H.C. Genetic role in the predisposition or breed susceptibility to suffer from H.C. was suspected due to the significant interbreed differences in the incidence of H.C. between purebred and nondescript animals, besides when animals were found with both horns affected (Naik et al. 1969; Naik and Randelia 1978).

Viral etiology was suspected when Pachauri and Pathak (1969) reported the curative effect of an autogenous vaccine prepared from H.C. tissue. However, Somvanshi et al. (1983) have demonstrated free and budding virus-like particles in the H.C. cells from their electronmicroscopic studies. Whether, this is a causative or a passenger virus needs to be proved. So the etiology of H.C. is still obscure and the possible involvement of virus cannot be ruled out. It seems like human cancer, H.C. has also multiple etiology, predisposing and direct. Only further planned studies would unravel the real etiology.

CLINICAL SYMPTOMS AND DIAGNOSIS :

The clinical symptoms observed in cases of H.C. have been described by Kulkarni (1953), Lall (1953), Naik et al. (1969), Pachauri and Pathak (1970) and Kaul and Kalra (1973). In early cases of H.C. the base of the affected horn is warm, soft and painful to touch, swollen and it evinces dull sound on percussion. There is sero-sanguinous discharge running from the nostrils. The affected horn slowly bends and hangs by the side of the head (Fig.1), and then falls off exposing an open wound studded with cauliflower-like growth which finally invades into the sinuses, cranial bones, muscles and skin at the base of horn. The parotid, mandibular and other local lymph nodes often seen enlarged with metastases. The animal becomes weak, anemic, emanciated and dies in 3-6 months if not treated in time.

The recent advances in the early diagnosis of H.C. by employing exfoliative cytological and radiological methods have helped to treat the animals before the spread of the disease and save them (Naik et al. 1988). Malignant exfoliated cells have been demonstrated in the mucous discharge from the nose of an affected cow and its horns were X-rayed to know the extent of the disease (Fig.2). The horn was amputated surgically taking guidance from the X-ray picture and the cow was discharged and no recurrence was observed during 8 months (Fig.3).

HISTOGENESIS AND PATHOLOGY

The origin of H.C. was misunderstood for a long time until Heranjal et al. (1980) suspected its origin from the m.m. lining

the horn core cavity and Naik et al. (1988) confirmed it further with an evidence of a case. The histopathological study of the m.m. from an early affected horn of a cow (Fig.3) revealed metaplastic changes of ciliated columnar cells of the m.m. leading to Sq. cell carcinoma showing typical whorls and cords of squamous cells (Fig.4). In advanced cases epithelial pearls and keratinized centres were seen.

The H.C. is a malignant squamous cell carcinoma as revealed by light and electronmicroscopic studies (Naik et al. 1969; Somvanshi et al. 1983), which metastises in the local lymph nodes and sometimes in the viscera. It also invades into the frontal and nasal sinuses and skin at the base of the affected horn in advanced cases. It also invariably recurs after surgical removal. An early detected case can be cured with conventional surgery (See Fig.3). In some advanced cases after surgery, radiotherapy, chemotherapy and immunotherapy may prove beneficial.

DISCUSSION

Bullock is the main source of draught power in a predominantly agricultural country like India. The H.C. affects mainly the working bullocks and India has more than 70 million bullocks (Sukhatme, 1968). The bullocks affected with H.C. usually die in 3-6 months. If we assume that the overall incidence of H.C. as 9.99/1000 (Naik and Randelia, 1978) holds good for all the male cattle in India, then there could be about 700,000 H.C. cases among them which means a tremendous economic loss of about 2800 million rupees per year at the rate of Rs.4000/- per bullock, to the farmers. So this is a national problem which needs immediate programme to undertake in-depth study of different aspects of H.C. like yoke and yoking system, providing devises to protect the horn from injury, and to detect the etiology, methods of prevention and treatment of this dreaded malignant disease. So the Veterinary Research Institutes and Agricultural Universities which support Veterinary Sciences in India should provide facilities to undertake studies on Horn Cancer.

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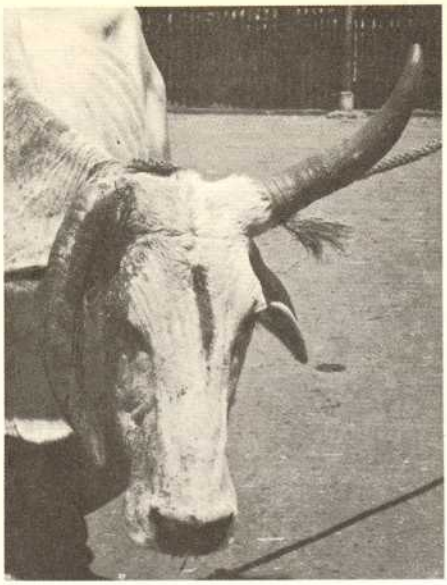

Fig.1 : Shows Rt.horn affected with H.C., hanging by the side of head of a Malvi bullock

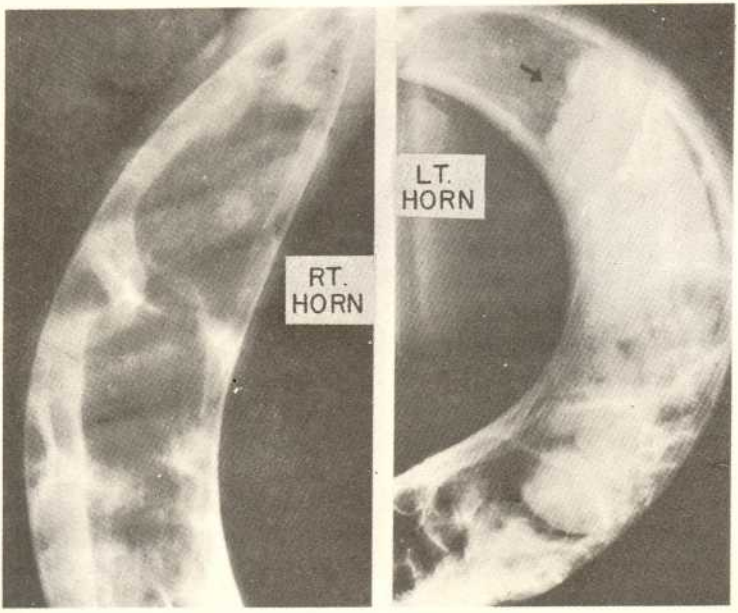

Fig.2 : Radiograph of horns. Rt.horn normal, Lt.horn affected with cancer in the middle shown by arrows.

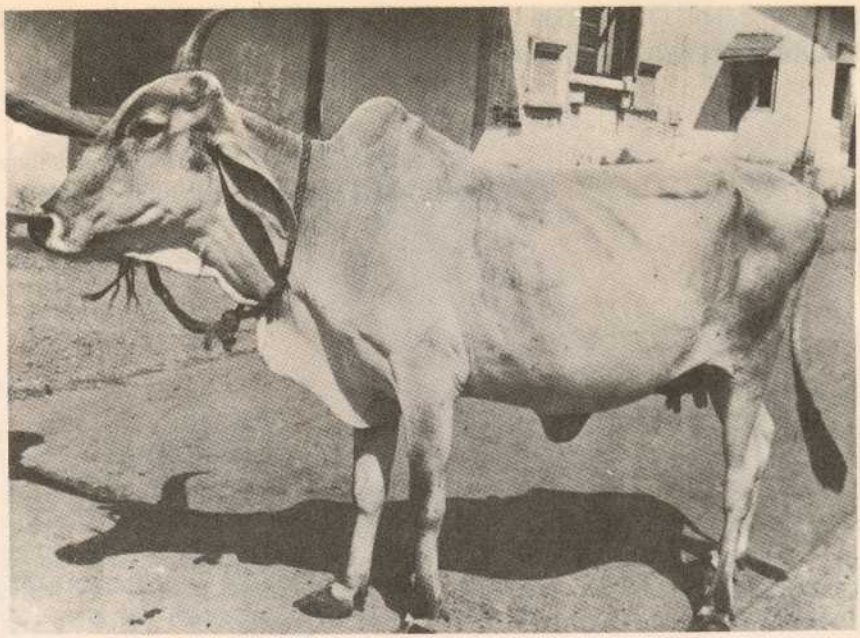

Fig.3 : Kankrej cow cured after the amputation of the affected horn.

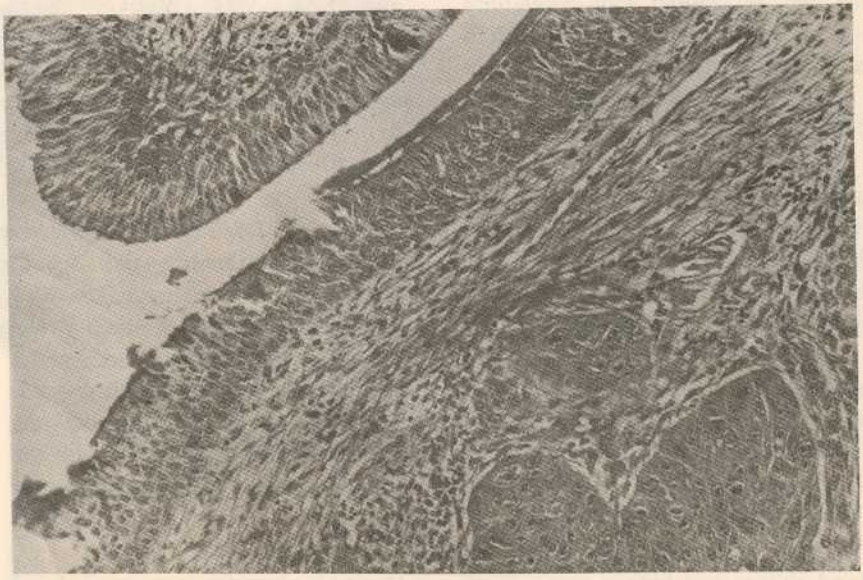

Fig.4 : Shows metaplastic changes in the columnar ciliated cells leading to Sq.cell carcinoma. H. & E. x 150.

AN OUTBREAK OF FISH ERYTHRODERMATITIS CAUSED BY AEROMONAS HYDROPHILIA

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The Epizootic Ulcerative Syndrome (EUS) in fishes has been reported from different states of India in recent years. Heavy mortality in fresh water fishes of Vidarbha was reported in newspapers from September to December, 1990. Investigation of fish mortality in Bhandara district revealed following observations.

The gross external lesions observed in affected fish were ulcerative lesions on abdomen and head. In severe cases ulcerative lesions perforated the abdominal wall. Sloughing of fins was another manifestation in affected fish. Fresh water fishes of all the species and age groups were almost equally affected by the disease with a mortality rate of 80%.

Post-mortem examinations of diseased fishes revealed, mesentric haemorrhages, severe congestion of liver with distended gall bladder. Extensive haemorrhages on kidney was another common lesion in majority of cases.

Histopathological examination showed vacuolar degenerative changes in liver and extensive haemorrhages with foci of coagulative necrosis in the kidney. Heart muscle showed degenerative changes.

Heart blood culture and kidney tissue from sacrificed fish revealed gram negative motile rods on beef agar. Organisms failed to grow at 37°C, however, desired growth could be obtained at room temperature ranging from 20 to 25°C. Biochemical properties of the organism isolated showed 1) Oxidase +ve 2) M.R. +ve 3) V.P. Indol -ve 4) lactose, manitol, glucose maltose fermented with acid 5) Coagulase positive 6) starch hydrolysis +ve 7) growth on 7.5% Nacl broth +ve. Organism was found to be sensitive to 1) Nitrofuron 2) Oxytetracycline 3) Neomycine 4) Chloromphenical.
Causative organisms isolated from affected fish were identified as Aeromonas-hydrophilia and disease was tentatively diagnosed as Erythrodermatitis caused by Aeromonas-hydrophilia as per Roberts (1971). Mandal et al. 1990 has also reported Aeromonas-hydrophilia in association with epizootic ulcerative syndrome in fishes of West Bengal.

Inoculation of identified and isolated organism in apparently healthy fish developed red patches on abdomen and head within 72 hrs., indicative of 'Erythrodermatitis'. Heart blood culture from sacrificed experimental fish, again revealed the Aeromonas-hydrophilia organism. Thus the causative relationship of Aeromonas-hydrophilia with the disease was established conclusively as per Koch's postulates.

During the breeding season one batch of eggs completely failed to hatch at aquaculture unit, Punjabrao Krishi Vidyapeeth, Akola during August 1991. Isolates from the trichurated

eggs revealed Aeromonas-hydrophilia in pure culture and hence, was probably responsible for embryonic mortality.

The disease could be treated successfully by treating water bodies by 0.04% nitrofurozolidone in affected ponds. Suitable immunoprophylactic measures will have to be devised in the near future for effective control of the disease.

SUMMARY

Causative relationship of Aeromonas-hydrophili with erythrodermatitis in fish is reported. Isolation of Aeromonas-hydrophilia in pure culture from fertilized fish eggs which failed to hatch, indicates it to be responsible for early embryonic mortality.

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Plate 1 :- Showing Erythrodermatitis lesion on the abdominal wall

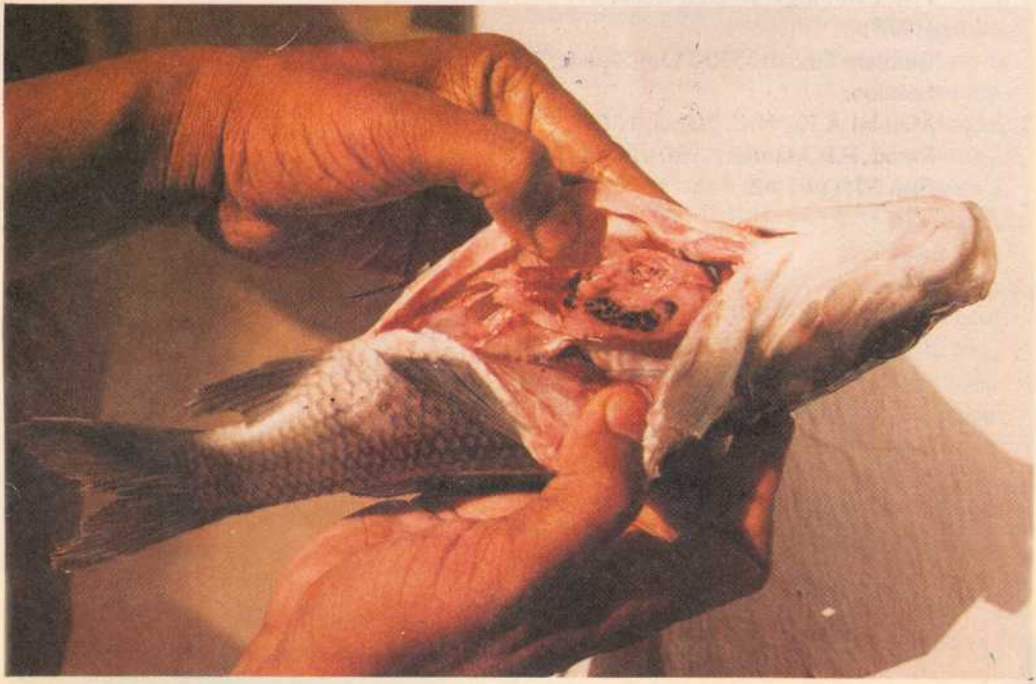

Plate 2 :- Showing haemorrhages on the mesentry, a typical septicemic lesion

MANAGEMENT OF FERTILITY IN CATTLE AND BUFFALOES

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Livestock plays a vital role in the agrarian economy of India by providing animal proteins such as milk, meat and eggs, besides providing bullock power for agricultural operations and organic manure to enhance soil fertility. Livestock production has helped the farmers with availability of fluid cash to meet their routine needs of seed and fertilizer purchases etc.

Optimum fertility of breedable cows and buffaloes is the key to dairy economics, since reproduction is an essential pre-requisite to livestock production. Livestock management, therefore, plays a pivotal role in it. Proper managemental practices help in reducing stress conditions and enhancing fertility index of milch animals.

Besides proper housing, feeding and care, normal reproductive rhythm of each cow/buffalo is essential for ensuring regularity of calvings with optimum lactation period alternating with a narrow dry period. In order to maintain this balance, dairy cattle management should include the following regimen :

1. Regular heat detection programme by parading a 'pointer' / vasectomised bull, twice daily in the morning and evening to detect cow in heat.
2. Breeding the cows in heat with frozen semen of outstanding bulls by artificial insemination (A.I.) or natural service.
3. A well planned regular sexual health control programme to be rigidly implemented alongwith practice of A.I. It includes periodical gynaeco-clinical examination of the cows/buffaloes at regular intervals, with proper recording of the findings in individual Life History Cards and follow-up therapy for reproductive disorders thus detected. It helps in early detection of pregnancy and proper monitoring of reproductive status of each cow/buffalo in the herd.
4. Care of animals in advanced stage of pregnancy followed by scrupulous parturition hygiene helps to minimize post-parturient disorders with early involution of uterus. It checks the incidence of repeat breeding due to infectious infertility.

Proper implementation of these measures leads to enhanced fertility. However, functional disorders need to be investigated and treated timely. These are : Anoestrum; Sub-oestrus (Silent heat); Anovular heat; delayed ovulation and cystic ovarian degeneration (COD).

True Anoestrum : This condition is due to quiescent inactive ovaries with total cessation of cyclic activity. The cow/buffalo is empty (non-pregnant) with smooth ovaries devoid of any palpable evidence of either follicular or luteal activity. GnRH (Receptal-Hoechst) therapy is indicated in such cases. Post-partum anoestrum is more common in buffaloes due to persistent corpus luteum

(PCL). PGF2alpha (Dinofertin) therapy is useful in such cases.

Silent heat (sub-oestrus) : is common in buffaloes (20 to 40%) with normal cyclical changes. GnRH definitely improves conception rate (CR) in buffaloes (Rao and Rao, 1979). Receptal (Hoechst) 5ml I.M. injection immediately after insemination improves C.R. significantly. This is due to the beneficial effect of GnRH on regulation of ovulation timing and should therefore be immensely valuable in improving fertility in the lowly fertile buffalo (Kaikini, 1989).

Anovular heat : Oestrus without ovulation results in anovular heat. Its incidence is high (24%) in non-descript (local) cows, resulting in chronic repeat breeding (Kaikini, 1975; Kaikini et al, 1977). In such cases, GnRH (Receptal-Hoechst) therapy on day 13 of oestrus cycle with insemination on observed heat gave good results (Bhosrekar et al, 1986).

Delayed Ovulations : These generally occur in cyclical non-breeder infertile cows. It is due to delayed LH surge. GnRH (Receptal-Hoechst) injection (IM) at the time of insemination/service is indicated with resultant ovulation within 24 hrs. (Rao and Rao, 1979; Bhosrekar et al., 1986; Muzumdar, 1989; Agarwal and Pundit, 1991; Iyer and Sreekumaran, 1992). Muzumdar (1993) reported distinct improvement in conception rate with GnRH (Receptal) therapy on day 12 post-calving in cross-bred cows (CR 62.6%).

Cystic Ovarian Degeneration (COD) : Cysts are due to repeated anovulations. The follicles instead of becoming atretic persist and increase in size enlarging the ovary. Cow becomes Nymphomaniac. Stress of milk production/ yield results in cystic ovaries (Hendrikson, 1956). Follicular cysts can be treated by GnRH or HCG (LH). A dose of 3000 to 4500 I.U. HCG is recommended. Mucometra develops in untreated cases of C.O.D (Kaikini, 1992).

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USE OF GnRH IN DAIRY COWS

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The most significant development in the field of bovine reproduction in the past decade has been the commercial availability of gonadotropin releasing hormone (GnRH) and its analogues. Maximum benefit from the use of GnRH can be obtained only if the hormone is used in the prescribed manner after making an accurate diagnosis.

GnRH AND ANALOGUES :

GnRH, also referred to as luteinizing hormone/follicle stimulating hormone - releasing factor (LH/FSH-RF) or Luteinizing hormone - or releasing factor (LH-RH), is a decapeptide of hypothalmic origin which stimulates the release of pituitary gonadotropins (follicle - stimulating hormone (FSH) and luteinizing hormone (LH) in farm animals.

Administration of GnRH causes dose related increases in the serum concentration of LH and FSH in cattle. Response to GnRH treatment is influenced by the physiological reproductive state of the treated animals. For instance, when GnRH is used for the induction of ovulation, the best results are obtained when a suitable preovulatory follicle is present. Also when GnRH is used in the post-partum cow, the pituitary response to GnRH has been shown to increase approximately nine days after parturition.

CYSTIC OVARIAN DEGENERATION (COD)

During the normal estrus cycle, the release of pituitary gonadotropic hormones (FSH and LH) is controlled by releasing factors (GnRH) from the hypothalamus under the influence of various external stimuli and ovarian steroid hormones (estrogen and progesterone). Several causes of cystic ovaries have been postulated including

1. inhibition or failure of release of GnRH or LH
2. imbalance of the gonadotropins (FSH and LH)
3. imbalance of circulating steroid hormones at critical times during the cycle and
4. abnormal time sequence of hormonal changes during the cycle.

The major cause of cystic ovarian degeneration in cattle is dysfunction of the neuro-endocrine mechanism controlling ovulation, specifically a failure of the pituitary to release sufficient amounts of LH at the time during the cycle.

A complete failure of LH release results in failure of ovulation and persistence of the follicle with associated clinical signs or follicular stresia.

Incomplete release or release of insufficient amount of LH results in failure of ovulation, persistence of follicle with varying degrees of luteinization in the wall or the formation of leathery cyst.

Delayed release of LH results in asynchrony of estrus and ovulation commonly referred to as delayed ovulation.

GnRH TO COWS WITH COD

When GnRH is administered to cows with cystic ovaries it stimulates the release of LH with resulting ovulation or luteinization so that within 10 days after treatment the plasma progesterone levels are similar to those seen during the normal luteal phase. The average time post-treatment that it takes cows to begin estrus is 18 to 25 days. To avoid a period of anoestrus and a subsequent long interval from initial treatment to breeding in cows with cystic ovarian degeneration two lines of treatment have been devised with GnRH and prostaglandin (PG). In cows with follicular cyst, administration of GnRH followed by the injection of prostaglandin 9 to 14 days later will ensure estrus within two to five days and breeding on the induced estrus results in acceptable conception rate. In animals with luteal cyst or when a corpus luteum and a cyst co-exist, administration of PG induces luteolysis in three or four days and administration of GnRH at estrus ensures ovulation and formation of competent corpus luteum.

The main advantage of the above methods is the considerable time saving from initiating of treatment to breeding and the improved conception rate.

GnRH USE AT INSEMINATION :

The success of AI is dependent on the proper timing of insemination relative to the time of ovulation. Because of variation in estrus duration and problems associated with estrus detection failure of conception may be due to breeding at the wrong time during estrus. One method of assuring satisfactory conception rate is to ensure that ovulation occurs within 7 to 18 hrs. after insemination. This can be achieved by the administration of GnRH during estrus. In considering the proper time of administering GnRH to mimic the natural situation it must be remembered that 1) LH peak occurs within two to four hrs. after exogenous GnRH administration 2) during the normal cycle, ovulation occurs 18 to 30 hrs. after L.H. peak 3) a spermatozoon requires four hours in the genital tract for capacitation and 4) ovum fertility lasts for up to 12 hrs. Thus GnRH can be ideally administered at the onset of estrus to mimic the natural situation. In practice, GnRH can be administered at the beginning of estrus, five to six hours before artificial insemination or at the time of artificial insemination in an attempt to improve conception in normally cycling cows.

USE OF GnRH TO IMPROVE FERTILITY :

Failure of ovulation, follicular atresia and delayed ovulation have been postulated as contributing to bovine infertility. GnRH therapy in such cases can be instituted after other causes of infertility have been eliminated.

Low progesterone concentrations during the luteal phase have been reported for repeat breeder cows. Administration of GnRH causes dose-related increase in serum concentrations of LH in cattle. The adenohypophysis responsiveness to GnRH is enhanced by the stimulatory action of estrogen and the self priming action of GnRH. Therefore the GnRH induced additional surge of LH will enhance

luteinization of granulosa cells which ensure adequate production of progesterone to maintain pregnancy when successful fertilization occurs.

GnRH can also be used to a limited degree following estrus synchronization or after treatment to cause superovulation. The aim of such treatment is to maximize the ovulatory rate and improve conception rate.

EARLY POST-PARTUM USE OF GnRH :

The aim of dairy cow producers is to achieve a calving interval of 12 to 13 months. This can be attained if cows are successfully bred within 50 to 85 days after calving GnRH administered 10 to 20 days post partum induced early cyclical activity with resulting increased fertility in dairy cows at first insemination. The rationale for giving GnRH 10 to 20 days post partum is based on the observation that dairy cows fertility during the normal breeding period is directly proportional to the number of estrus cycles before breeding and that GnRH should enhance the chances of early resumption of cyclical activity. Cows with periparturient disorders (reproductive, metabolic or others) are likely to benefit from GnRH given 10-20 days post-partum.

EFFICACY OF HUMAN CHORIONIC GONADOTROPIN (HCG) IN AUGMENTING CONCEPTION RATE IN BUFFALOES

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The success of Artificial insemination depends on proper timing of insemination relative to the time of ovulation. In buffaloes because of variation in estrus duration and problems associated with oestrus detection, failure of conception may be due to breeding at the wrong time during oestrus. One method of obtaining satisfactory conception rate is to ensure that ovulation occurs within 7-18 hours after insemination. This probably can be achieved by use of Human Chorionic Gonadotropin (HCG), Luteinizing Hormone (LH) (Kavani and Kodagali, 1984) and Gonodotrophic Releasing Hormone GnRH (Schels and Mostafauri, 1978). According to Hunter (1980) the injection of LH must precede the endogenous surge of LH which is occurring during proestrum, if ovulation time is to be controlled by the treatment and must therefore be given during proestrum. This study was undertaken to find out the effect of HCG given during proestrum and at the time of AI on ovulation and its influence on conception rate in normally cycling buffaloes and to fix the time for HCG injection for inducing of ovulation.

MATERIALS AND METHODS

45 healthy pluriparous normally cycling buffalo cows reported for Artificial insemination at Madras Veterinary College were selected and utilized for this study. All were maintained by milkman on recommended Milch ration under urban condition. All the animals were observed for one full oestrous cycle before treatment and were randomly allotted for these treatment groups, A, B and C. Human chorionic Gonadotropin (HCG) 1000 IU (Chorulon, Inter Care Ltd.) diluted with 2 ml diluent was administered at the time of artificial insemination in group A animals (n=14) and during proestrus in group B animals (n=16). Group C (n=15) animals were given 2 ml saline only at the time of artificial insemination served as control. Insemination was done by a single person utilising frozen semen. All the animals were observed carefully and artificial insemination was done if any buffalo exhibited estrus again. All the animals were tested for pregnancy rectally at about 45 days after the last Artificial Insemination and results were analyzed.

RESULTS AND DISCUSSION

In this study, HCG given at proestrum (or) at the time of Artificial Insemination in an attempt to improve conception rate in normally cycling buffaloes resulted in varied conception rate and is presented in the table. In that the conception rate at first AI was high in HCG at the time of insemination ie. 18.7, 57 and 33.33 percent to the A,B and C groups respectively. After 2 AI the conception rate were 43.75, 71.43 and 46.67 percents respectively. Kavani and Kodagali

(1984) reported 66.66 percent conception rate in repeat breeder buffaloes after HCG at AI. In buffaloes the standing estrus observed in the study was less than 18 hours and there were difficulties in fixing the proestrum. Some animals of A group have come to oestrum 48 hours after the HCG injection. The HCG primarily an LH like effect (Arthur et al. 1989) has caused better ovulation and conception in group B. As there is no HCG effect in group C and the untimely injection of HCG group A might have resulted in lesser conception rate in groups A & C. The higher conception rate in group B can also be correlated with the action of HCG which stimulates follicular maturation, ovulation, CL formation and its maintenance ((Arthur et al. 1989).

According to this clinical trial it is concluded that 1000 IU HCG injection at AI improve conception rate in normally cycling buffaloes.

Table

Treatment group treated	No. of buffaloes	Pregnancy at I AI	Pregnancy II AI
Group A	16	3 (18.7%)	7 (43.75%)
Group B	14	8 (57%)	10 (71.43%)
Group C	15	5 (33.33%)	7 (46.67%)

SUMMARY

Human chorionic Gonadotropin administered intramuscularly at the time of artificial insemination resulted in better conception rate in buffaloes than at the time proestrum.

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OBSERVATIONS ON SPONTANEOUS AFLATOXICOSIS IN RABBITS

Dakshinkar N.P., Kolte R.M., Sharma S.R., Sapre V.A., Paikne D.L. and Gore A.K.
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Death due to spontaneous aflatoxicosis was studied in 27 rabbits. The affected animals were weak and emaciated. Overt gross lesions were observed only in the liver which showed multiple abscessation and fibrosis. Microscopically nectrotic changes were observed in liver and intestine.

Rabbits are extremely sensitive to aflatoxins elaborated by Aspergillus flavus, A.ruber, A.wentii, and A.parasiticus. (Newberne, 1973). A loss of 400 out of 7000 Angora rabbits due to aflatoxicosis was reported by Mehrotra and Khanna (1973). This paper deals with the study of naturally occurring aflatoxicosis.

MATERIALS AND METHODS

Material from 27 rabbits suspected to have died due to aflatoxicosis formed the basis of this study. Heart blood were cultured on routine media for isolation of pathogenic organisms. Representative piece of liver, spleen, heart, kidneys and intestines were collected in 10% formaline for histopathological examination by thin layer chromatograms.

RESULTS AND DISCUSSION

Animals under study were fed with a pelleted ration containing 55% maize with added vitamins and minerals. Almost all the livestock feed ingredients are susceptible to fungus infestation as well as aflatoxin production. But, maize is most prone to aflatoxin contamination in India (Panda, 1989). The climatic condition during the period of mortality was conducive for fungal flare as evidenced by rain 2 mm, optimal temperature range of 29.9 to 31.2C, humidity 65 to 73, wind KMPH 2.3 to 4.8 and evaporation 3.1 to 3.5 mm.
Toxicological examination of feed revealed that the sample was positive for aflatoxin under a thin layer chromatograms.

Clinically the ailing rabbits were weak and hide bound, feed consumption was reduced, lassitude, dehydration followed by death. Similar clinical manifestations were also reported by Mehrotra and Khanna (1973), Sahoo et al. (1991). Gross post-mortem findings evinced fibrotic liver with multiple small abscessation. No overt changes were observed in other organs. Direct impression smears from liver and faeces revealed no coccidial oocysts or parasitic ova on microscopical examination. Liver is the first organ to be affected by mycotoxins. Histopathological examination of the liver showed coagulative necrosis of lobules at the periphery. At some places there was stagnation of bile pigment and overdistention of sinusoids. At the periphery of lobules focal accumulation of lymphocytes was evident.

These changes in liver simulate earlier observations (Clark et al. 1980 and Gill et al. 1985).

The intestinal villi showed coagulative necrosis and leukocytic infiltration in the mucosa. The kidneys revealed atrophy of tubular epithelium and hyper cellularity of glomeruli. The alterations noticed in intestines and kidneys were also reported by Sahoo et al. (1991). Other organs did not reveal any significant change. However, Serban et al. (1981) noticed small haemorrhages in many organs and severe lesions in lungs.

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READERS' VIEWS

Million congratulations to you and Hoechst India Limited for the excellent positive decision taken for the birth of Blue Cross Book which was badly needed by the practitioner, field veterinarian to keep them abreast of the latest therapies and research developments in veterinary science in a very lucid and regular bi-annual "Blue Cross Book". Hats off to Hoechst India Limited !!!

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Ph.D.,F.R.V.C.S. (Sweden)
Fellow of ISSAR, Nagpur
Ex-Dean, Faculty of Veterinary Science,
P.A.U., Akola.

I used to receive a copy of the Blue Book from Hoechst Germany for many years until 1986. Thereafter, it was suddenly stopped. I am glad that you have started it again and I pray for your grand success in this venture.

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I am very happy that with all the efforts, you could succeed in bringing out the Indian version of Blue Book - Blue Cross Book. I wish you a grand success.

Col. N.M.Singhvi, MVSc, Ph.D.
Central Mili. Vet. Lab. Meerut Cantt.

Needless to say that the Blue Cross Book matches in get up and quality to the Blue Book which used to be brought out by Germany.

K.G.Subramanian
All India Sales Manager,
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Please accept my heartiest congratulations for producing a very good compiled information on vector control in livestock. Coupled with it, myself and my colleagues have appreciated very much on curtain raising articles on "Could the Indians have known about embryo transfer technology 2500 years before ?". We have liked the contents of this article very much in your Blue Cross Book.

Dr. M.S.Saini
Asstt. Scientist,
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Hissar

My compliments to the Editor, Dr. K.A.Mujumdar and the Editorial Board Members of the Blue Cross Book. I am sure, this book will go a long way in serving the practising veterinarians in India and also will highlight your esteemed organization as an excellent technically sound company.

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Vice President
Animal Health Divn.
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After a period of long gap, I happened to see the Blue Cross Book for the veterinary profession of April'93 issue in our college library.

Dr. A.S.Bagi, M.Sc, Ph.D.
Prof & Head of Vet Anatomy
Vet Science College, Anand.

The Blue Cross Book is certainly an impressive publication and I am sure that your veterinary surgeons will find it most interesting.

Stuart Cowan
Business Development Manager
Biologicals PGE
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I would like to congratulate you and your Animal Health team for the initiative of recirculating Blue Cross Book.

Jean Falgoux
Roussel Uclaf
Romainville
France.

INFECTIOUS BURSAL DISEASE IN POULTRY (IBD)

A highly virulent IBD virus was isolated in Japan and designated IBD strain 90-11, which was found to cause severe immuno suppression than reference strain GBF-1. It is feared that broilers in Japan may be getting infected with IBD strain 90-11 at 3 to 4 weeks of age when maternal antibody fades and this may trigger New Castle Disease outbreaks and secondary bacterial infections in flocks.

T. Nakamura., Y.Otaki and T.Nunoya (1992)
Avain Dis 36:981-896

In Netherlands, till 1981-86, most broilers were not being vaccinated against IBD and use of inactivated vaccine in breeder flocks was sufficient to protect the broiler chicks. However, from 1986 onwards, serious losses occurred due to IBD in broilers, which could not be completely controlled by intermediate type IBD vaccine. The use of "hotter" vaccine strains proved effective in curbing IBD losses.

B.Kouvenhoven and J.Van. deu. Bos
Proceedings Western Poultry Disease Conference (1993)

In some parts of India viz. around Namakkal (Tamil Nadu), Hyderabad (A.P), Bangalore (Karnataka), Bombay-Pune belt (Maharashtra)., currently severe outbreak of IBD is prevailing. This epidemic is characterized by heavy mortality (over 20%) in layer pullets (18-20 weeks age) and broilers showing lesions of severe haemorrhages in bursa and thigh muscles and symptoms of white diarrhoea and dehydration. It is suspected to be caused by a hot strain of IBD virus and the vaccine available in India (Leuckerts strain) is not giving full protection. Scientists are discussing about common vaccination strategy for breeder flocks so as to evolve a uniform pattern of vaccination at farm level. However, the variations in the field challenge on different farms is likely to make such policy unworkable.
(Editorial committee ..... based on available reports [1993])

TUBERCULOSIS AND AIDS - A DEADLY COMBINATION

The dramatic increase in the reported cases of human T.B. (*Mycobacterium tuberculosis*) associated with HIV infection suggests that there will be an increase in the incidence of bovine T.B. in humans, similarly associated with HIV. This would inevitably result in increase transmission from humans not only to other humans but also to animals thereby increasing levels of *M. bovis* in the environment. Such a cycle would clearly concern both Veterinary and Public Health authorities in those countries which have already successfully controlled bovine T.B. However in the developing world, where there is an existing pool of bovine TB in cattle and wild poulations together with high prevalence of HIV in human population, the consequences are likely to be uncontrollable. If this is not sufficiently gloomy, Daborn and Garnage (Br Vet J 1993, 149:405-417) have been described M avium in humans associated with HIV infection.

R.P.Kitching (1993)
Br Vet J 149; 403

SELECTIVE BREEDING FOR IMMUNOCOMPETENCE

When 998 sows of four different breeds viz, Dutch Landrace; Norwegian Landrace; Finnish Landrace and Yorkshire were immunized with 'key hole limpet' Haemocynin antigen and evaluated for CMI and humoral response, using Lymphocyte stimulation test, skin allergy and Ig G, it revealed markedly low levels of immune response in Yorkshire; high response in Dutch and Norwegian Landrace and intermediate in Finnish Landrace breeds. Authors conclude that it might be possible for selective breeding of swine of enhanced immunocompetence.

P.Joling; K.S.Mok; de varies G Reilingh; P.J.M. Wever; R.S. Cornelis; J.P.H. Oskam and A.M.Henken (1993) Vet Quarterly Netherlands 15(1):9-15

HEINZ-BODY ANAEMIA

Heinz body anaemia in dogs is induced by toxins. Onions, Acetaminophen, Vit K, Zinc, Benzocaine Phenyl hydrazine and Methline blue can cause it.

D.M.Houston (1993) Vet Hum Toxicol 35; 158-161 (Canada)

EARLY PREGNANCY DIAGNOSIS IN DAIRY CATTLE

Milk progesterone levels estimation with an 'on farm' Latex Agglutination test (LA) or ELISA compared favourably with quantitative RIA progesterone for pregnancy. ELISA was 92.3% accurate for early pregnancy (19-23 days) and 100 % for detecting oestrous. LA was better for non pregnancy and 74.6% accurate for oestrus detection.

D.Romagnolo and R. L.Nebel (1993) Theriogenology 39;1121-1128

SPOROZOITE SURFACE ANTIGEN OF EIMERIA TENELLA AS IMMUNIZING AGENT AGAINST CAECAL COCCIDIOSIS.

Antigen extracted from surface of E.tenella sporozoites conferred an immunity that protected chicks against challenge infection of 10^4 sporulated oocycts. Best results were obtained by :-

i) Two injections of $Al(OH)_3$ absorbed antigen (250 mg each) given subcutaneously.

ii) Four oral administration of Liposome entrapped antigen by gastric intubation.

Protection indexes were 70% and 88% respectively. Studies of systemic and local antibodies produced, indicated 20 different molecules in the detergent antigen.

A.Rhalem; H.Sahibi; A.Dakkak; F.Laurent; M.Kazanji P.Yvore and P.Pery (1993) Veterinary Immunology and Immunopathology 38:327-340

COMPARATIVE GENOME ANALYSIS

- A novel strategy to study the genetics of host parasite interaction.

In this "Stoll - Stunkard Endowment Fund Lecture" 1992, the authors state that :-

i) Modulation of host susceptibility to infection by genetic background is both profound and complex.

ii) Analysis of human genome is currently one of the most intensely pursued research efforts of molecular medicine and biology, which will help in understanding of molecular basis of genetic disease.

iii) Formidable challenges will be extract useful information from enormous ocean of data of the genome project.

iv) Here comparative genome analysis can help. Once disease loci have been mapped in the mouse or other experimental animal

models, comparative mapping will focus the search for human homologues and help pinpoint sequences corresponding to human disease genes.

v) Extension of comparative mapping to livestock species will allow the identification of agronomically important disease loci and will find immediate application in marker assisted breeding of live stock

vi) It appears that the future for comparative genome analysis is bright and that we have seen only the beginning of a new and exciting research direction of mammalian genetics.

Jing Liu; Mathieu Cellier; Erwin Schurr and Emil Skamena (1993)
J. Parasitol 79(4); 463-469.

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