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*The
Blue
Cross
Book*

for the Veterinary Profession



Hoechst Roussel Vet

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PREFACE



W. J. Bader
Managing Director
Hoechst Roussel Vet Pvt. Ltd.

Dear Reader,

While stepping on to another edition of "*The Blue Cross Book*", I would like to extend a "big thank you" to all readers, partons and well-wishers for their immense support which has helped us update this journal, dedicated to the veterinary profession. A special vote of thanks to all contributors of technical articles without which the smooth running of this journal would not be possible !

The 11th of May '99 was "Technology Day" when the Prime Minister, Shri Atal Behari Vajpayee declared the development of **IBR (*Infectious Bovine Rhinotrachetis*)** vaccine for animal welfare as one of the ten milestones of the year. I am glad to inform you that **IBR vaccine** will be produced at our Wagholi plant, Pune and will be launched in August - September '99 under the trade name "**Ibrivax**".

As you are well aware that the envolving disease with **IBR** , can show a complexity of different symptoms expressed in the respiratory tract, the genital tract and reproductive performance. The **IBR** virus, commonly known as **Bovine Virus Type I (BHV-1)** has been reported to cause abortion after an incubation period of 3-6 weeks, mainly between the fifth and eighth month of gestation. **In this issue, we have selected an article on BHV-1 which will highlight the economic significance of IBR and its control measures.**

The immunization with "**Ibrivax**" will be a useful tool to prevent clinical disease and thus minimize enormous economic losses. We hope you will find this article interesting and informative and would appreciate your comments.

Best regards,

Jochen Bader



THE PIONEER VETERINARY INSTITUTE IN INDIA-3

MADRAS VETERINARY COLLEGE

Madras Veterinary College was established in 1903 and assumed the onus of offering GMVC diploma. The year of 1925 proved to be a turning point in the history of Madras Veterinary College as it acquired the much coveted recognition of the University of Madras as affiliated college and earmarked the inception of B. V. Sc., degree course from 1936 for the first time in India. In 1958, Madras Veterinary College was recognised as the Southern Regional Postgraduate Research Institute. Veterinary College and Research Institute at Namakkal was established on 14.6.1985 and Fisheries College and Research Institute at Tuticorin was started on 9.7.1978. Tamil Nadu Veterinary and Animal Sciences University was established on 20.9.89. This University is first of its kind in Asia. The administrative building of Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) was constructed at Madhavaram Milk Colony and declared open on 26.5.1998 by the Hon'ble Chief Minister, Sree Kalaignar M. Karunanidhi. In this Building, the offices of Vice-Chancellor, Registrar, Controller of Examination, Finance Officer, Director of Research, Director, Centre for Animal production Studies, Director of Extension Education, Director Centre for Animal Health Studies and Estate officer are located. This Building was occupied on 15.9.1998.

Objectives :

- * To impart education in different branches of Veterinary and Animal Sciences and Fisheries.
- * To further advancement of learning and prosecution of research in Veterinary and Animal Sciences and
- * To undertake extension of such sciences to rural people in co-operation with the concerned Government Departments and various agencies.

Current Status :

Faculties

Faculty of Veterinary and Animal Sciences
Faculty of Fisheries Sciences
Faculty of Basic Sciences

Constituent Colleges

1. Madras Veterinary College, Chennai
2. Veterinary College and Research Institute, Namakkal
3. Fisheries College and Research Institute, Tuticorin

In addition, the services of the University are spread over to six Research Stations, including one Institute of Food and Dairy Technology, sixteen University Training and Research Centres, three Farmers Training Centres, two Krishi Vigyan Kendras, one

Avian Disease Laboratory, one Feed Analysis and Quality Control Laboratory, one Central University Laboratory and four operational Research Projects in Fisheries. There are two Centres of Advanced Studies, one in Clinical Medicine and Therapeutics at Madras veterinary College, Chennai and another is in Poultry Sciences at veterinary College and Research Institute, Namakkal.

Library :

The library facilitates particularly at Madras Veterinary College campus is reasonably adequate with 35,000 text books, 2,000 reference books, 61 Indian Journals, 159 Foreign journals and approximately 15,000 journals with complete back volumes.

Bio-Informatics Centre :

Bio-informatics at TANUVAS was established in the year 1990-91 with various facilities to serve the scientific community with current technical literature and other information through DIALOG, INET, NICNET, ERNET, MEDLARS and INTERNET. At BTIS various in-house technical databases are being created.

Clinical Facilities :

Specialised Units like, Neurology Unit, Ophthalmology Unit, Cardiology Unit,

Endoscopy Unit, Blood transfusion and Fluid therapy Unit, Haemodialyser Unit, Central Venous Pressure recording and Biopsy Unit for large animals and Rumen Medicine Laboratory are regularly used in clinical cases.

Human Resources Development Project:

World Bank assisted "Agricultural Human resources project" has been sanctioned to this University for further improvement of academic and developments of adequate infrastructural facilities. This Project is with financial assistance of Rs. 38.09 crores.

Extension :

The Directorate of Extension Education Disseminates information on various research findings of this university for benefit of farmers by conducting training programmes and through various communication systems.

Training Facilities :

The following training programmes are conducted regularly for the benefit of farmers at Krishi Vigyan Kendra, Farmers Training Centre & University Training & Research Centre spread over the State.

Agro-forestry, Dairy farming, Fish farming systems, Piggery farming poultry, Rabbitry,



TANUVAS : Administrative Building

Sheep & Goat farming

The Department of Communication and Entrepreneurship offers Distance Education programme and Entrepreneurial training.

- (i) Distance Education Programme on the following topics are offered :

Entrepreneurial training :

- (a) for students of Veterinary and Fisheries Sciences :

1. Entrepreneurial opportunities for students of veterinary faculty and unemployed Veterinarians.
2. Entrepreneurial opportunities for students of fisheries faculty and unemployed fisheries scientists.
3. Setting up of big/small animal clinic.
4. Fish processing plant
5. Establishing small scale Veterinary Pharmaceutical industry

6. Export of livestock, Livestock Products and fishery products.

- (b) for others :

Dairy by-products, Feed Analytical Laboratory, Meat and its by-products, Fish and Fish products, Ornamental Fish Culture, Prawn farming, Hi-Tech Goat farming, Poultry products Technology.

Course fee for both the categories is Rs. 500/- only. All the other details of the training programme can be obtained from :

The Professor and Head,
Department of Communication and Entrepreneurship,
Madras Veterinary College, Chennai
Tel.No. : 044-581506 (Extn.262),
044-560419 (Direct)
Fax : 044-560419

“No need of looking behind.
Forward ! we want infinite energy,
infinite zeal, infinite courage and
infinite patience then only
will great things be achieved !”

- Swami Vivekananda

Bovine Herpes Virus Infections in Cattle : Economic Significance and Control Measures

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Bovine Herpes Virus Type 1 (BHV-1) infection is responsible for serious economic loss to cattle farmers throughout the world (Fenner *et al.*, 1993). Also in India, it is reported to be widespread all over the country (Singh *et al.*, 1985). The infection is associated with a number of different pathological conditions. The principal target organs of BHV-1 infection, are the mucous membranes of the genital and respiratory tracts.

Clinical Manifestations :

Classical BHV-1 infection leads to disease of the upper respiratory tract. This form of the disease, *Infectious Bovine Rhinotracheitis* (IBR), was first described in the USA in the 1950's (Schroeder & Mayr, 1993). The incubation period is generally between 2 and 6 days. Clinical symptoms start with a rise in body temperature - which may reach values up to 42°C. The fever is accompanied by a severe nasal discharge, salivation,

hyperaemia of the nasal mucosa and ulceration of the mucous membranes of the nasal septum (Fig. 1). This is followed by inappetence and an increase in respiratory rate. Milk production is reduced in lactating cows (Forshner, 1988).

Conjunctivitis with profuse ocular discharge may occur and can lead to keratoconjunctivitis. Concurrent infections with other viruses or bacteria may result in the progression of upper respiratory disease to a severe, purulent bronchopneumonia (Wizigmann, 1987). A rare form of BHV-1 infection is encephalitis in calves (French, 1962).

The virus has been reported to cause abortions (McKercher & Wada, 1964) generally after an incubation period 3-6 weeks, mainly between the fifth and eighth month of gestation. Also, mastitis has been attributed to it.

The genital form of BHV-1 infection has been known for more than 100 years, being referred to as *Infectious Pustular*



Fig. 1 : Mucopurulent nasal discharge due to IBR (*Infectious Bovine Rhinotracheitis*) Infection.



Fig. 2 : Showing genital form of Bovine Herpesvirus-1 (BHV-1) generally called as IPV (*Infectious Pustular Vulvovaginitis*).

Vulvovaginitis (IPV) or *Infectious Balanoposthitis* (IBP) (Fig. 2 and 3). Gillespie *et al.*, (1959) first showed a close relationship between the viruses responsible for IPV / IBV and IBR. All virus isolates (including those associated with respiratory, genital or neurological conditions) were initially serologically indistinguishable. Their differentiation was only made possible by DNA analysis (Gregensen *et al.*, 1985).



Fig. 3 : Showing condition of genital organ affected with IBP (*Infectious Balanoposthitis*) .

IPV in cows and IBP in bulls was common in small farms throughout Europe but, with the increasing use of artificial insemination, these manifestations have minimised. In females, clinical signs include exanthema of the vulva and vagina, associated with pustules followed by necrotic erosions of the genital mucosa.

Immune Response :

The immune response to BHV-1 is partly antibody-mediated, and neutralization titres are usually taken to measure the immune status. Humoral antibodies do not, however, prevent BHV-1 latency. Antibodies may neutralize freely circulating virus but BHV-1 is not eliminated from the body.

Mucosal antibodies (IgA) seem to protect locally for short periods. Another immune mechanism are immune cells (T cells). This

can be shown by delayed hypersensitivity tests (Darcel & Dorwand, 1972).

Latency and Reactivation :

As with other herpes viruses, viral latency is a common feature of BHV-1 infection. The virus invades nerve endings and travels with the axonal flow to the regional ganglia, where it persists as a DNA copy. Reactivation of the latent virus may occur spontaneously under the influence of natural stress factors (such as disease, transportation, parturition) or it may be induced artificially by treatment with corticosteroids. Reactivated virus may cause recrudescence of the disease and shedding of virus from mucous membranes as well as in semen from bulls.

Although humoral antibodies do not prevent virus latency they markedly reduce the amount of excreted virus and influence the course of recrudescence disease. Once an animal is infected with BHV-1, it must be considered as a virus carrier for years of lifelong and thus as a potential source of infection for other individuals (Rolle & Mayr, 1993).

Epidemiology :

The discharges of respiratory mucosae, contain high amounts of BHV-1 virus for several weeks. The same is true for the mucosae of genitally infected animals. Transmission of the virus mainly occurs by direct contact or by aerosols. The morbidity rate thus may reach 100% with a mortality rate from 2 to 12% (Mayr, 1988). Male animals play an important role in the dissemination of the virus; either by direct genital contact or via artificial insemination.

Respiratory and genital forms of BHV-1 infection are rarely diagnosed at the same time in one herd. IBR is more widespread in feedlots. Infection often occurs during transport and thus contributes to the

multifactorial disease called "shipping fever". Dietary changes also may enhance the risk of BHV-1 infection (Fenner *et al.*, 1993).

Small ruminants are also susceptible to this virus. Although they do not develop severe disease, they may contribute to the dissemination of the infection.

Economic Loss due to IBR Infection :

IBR can cause considerable economic damage to the cattle farmer. In dairy cows, milk output may be diminished for 3 to 4 days and, in fattening cattle, there may be weight loss up to 30 kilograms. Also by abortion, the economic consequence of an infection are severe.

Under certain trade conditions, the loss of value is significant if cattle become seropositive. Furthermore, seropositive (infected) bulls can not be used in artificial insemination (Mayr, 1988 and Straub, 1988).

Prophylaxis and Control :

An essential part of disease control has been the implementation of measures designed to prevent virus transmission, i.e. to break the cycle of infection. The adoption of artificial insemination has resulted in a reduction of IPV; and import restrictions for BHV-1 positive animals, embryos and semen have allowed to establish and maintain an IBR-free status in some European countries.

A number of different approaches to control have been employed. For example, where infection pressure is low, BHV-1 negative herds have been established by serological testing twice a year together with removal of positive reactors (Ackermann *et al.*, 1989), a proposal which is now always satisfactory from a financial point of view.

Where infection pressure and incidence

are high and slaughtering of positive reactors is not economically feasible, instead various vaccination programmes have been employed. One example is the vaccination of only the seropositive cows within specified herds (Mayr, 1988). Although vaccination does not terminate virus latency, properly immunized animals do show a much reduced viral excretion. Thus vaccination can offer a means of breaking the cycle of infection. In other systems, all animals are vaccinated. Generally, vaccination against BHV-1 with live or killed vaccines is accepted as a useful tool for the significant reduction of economic loss from IBR and IPV. Inactivated vaccines have shown superior safety; excellent efficacy is obtained by addition of potent adjuvants. An efficacious oil-adjuvanted BHV-1 vaccine (IBRIVAX) has recently been developed by Kilari *et al.*, (1995) and is now commercially available.

Successful control should not only aim for freedom from disease but for the elimination of the virus and the latent infection. In specific eradication programmes, so-called marker vaccines are applied instead of conventional products. Conventional vaccines induce humoral antibodies that are indistinguishable from those that would be acquired as a result of natural infection. Thus vaccinated animals would be judged as possibly having a latent infection and would be precluded from semen production, export trade and exhibition. With the use of marker vaccines (negative marker), vaccinated animals can be differentiated from those carrying antibodies induced by infection.

Conclusion :

Infections in cattle caused by BHV-1 represent a significant economic threat to

farmers. The involving disease can show a complexity of different symptoms including the respiratory tract, the genital tract and the reproductive performance but also the eye and the central nervous system. The most striking feature is the latency of the infection and the possibility of spontaneous recrudescence.

Immunization with appropriate vaccines is a useful tool to prevent clinical disease and thus to minimise economic loss. Where animals are already (latently) infected, vaccines are able to suppress reactivation of the latent infection and virus shedding. Proper diagnosis by adequate tests is a prerequisite for vaccination campaigns and for the monitoring of the vaccination success in the cattle population

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“Think in the morning, act in the noon,
eat in the evening, sleep in the night.”

- William Blake

Efficacy of Pantol-C Suspension on Helminthic Infection in Buffaloes

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In buffaloes, helminth parasites commonly reported in India are Amphistomes, *Fasciola* Sp., *Moniezia* Sp., and Strongyle worms (*Hacmonchus* Sp., *Oesophagostomum* Sp., *Trichostrongylus* Sp. and *Bunostomum* Sp.). Incidence varies in different parts of the country in different seasons. As regards to Amphistomes, incidence of 69 - 80 % is reported in Uttar Pradesh (Sharma & Lal, 1983) and 15.3 - 40.35 % in Bihar (Sahay *et al.*, 1989), the higher occurrence being the monsoon months. In Madhya Pradesh, Banerjee & Agarwal (1992) have reported 32.9 % Amphistomes infections in buffaloes and in Maharashtra 3.93 % (Marathwada region) and 8.11 % (Mumbai region) are reported by Kulkarni *et al.*, (1984) and Narsapur and Deore (1994) respectively. As regards to the incidence of *Fasciola* infection in buffaloes, the incidence reported in Uttar Pradesh is 10 - 20 % (Sharma & Lal, 1983), 8.23 % in Sikkim (Katyari *et al.*, 1983), 7.8 % in Maharashtra (Kulkarni *et al.*, 1984) and 10.6 % in Madhya Pradesh (Banerjee & Agarwal, 1992).

In Mumbai region Narsapur and Deore (1994) reported 3.3% incidence of Strongyle worms in buffaloes. The information cited here is by no means a complete review but indicates that the infection is fairly high in buffaloes throughout the country.

Epidemiological studies on helminthic infection in animal are mostly based on fecal examinations of herds. Since in sub-clinical

or inapparent infections, the fecal examinations may be negative, the incidence of such infections might be far more widespread than what is indicated in epidemiological studies.

It is evident that sub-clinical parasitic infection in animals are of great economic importance since they result in sub-optimal production and sub-optimal reproductive performance (Coop, 1982) and immunosuppression (Crandall *et al.*, 1978; Barriga, 1978 and Crandall & Crandall, 1976). It has been shown that anthelmintic treatment improves productivity and health of symptomless cases which were found negative by fecal examination (Todd, 1972 and Kulkarni *et al.*, 1993).

Several factors are discussed in different journal and text books viz. season, immune status of animals, drug resistance, improper deworming schedules, bad management etc. which push herds of animals in to a state of sub-clinical helminthiasis. Hence, dairymen are increasingly accepting concept of "deworming schedule for production" and therefore, there is continuous search for broad spectrum anthelmintics.

Pantol-C suspension (Hoechst Roussel Vet Pvt. Ltd.), contains Fenbendazole 2.5 % and Oxytetracycline 7.5 %, is a broad spectrum combination anthelmintic. Narsapur and Hukeri (1997) reported 100 % efficacy of Pantol-C on *Fasciola* and Strongyle worms

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in cattle and further to that there was 18.57 % increase in milk yield post-treatment. The present trial was conducted with Pantol-C on sub-clinical helminthic infections in buffaloes and the results are presented.

Materials and Methods :

This study was conducted from 27/9/98 to 23/11/98 in two buffalo dairy farms around Mumbai namely, Farm A : Dairy farm Kashmir; Dist. Thane and Farm B : Samant dairy farm, Thane. Laboratory work was carried out at Veterinary Pathology Laboratory of Dairy Owners League Cooperative Society (DOLCOS), Jogeshwari (W), Mumbai.

Initially, the fecal samples of 100 buffaloes (Farms A+B) were subjected to qualitative stool examination by sedimentation method to note the incidence and type of parasitic infection, prevailing in the two farms.

Twentyeight animals, which were found positive, and nine, which were found negative in this test, were selected for this trial as Group X and Group Y respectively.

The fecal samples of these 28 animals were again subjected to qualitative examination by Stoll's method to determine

the EPG values of each infection.

The animals selected for trial (both X and Y groups) were administered Pantol-C suspension @ 60 ml/adult buffalo as single dose of oral drench. The following methods were adopted.

* Animals were clinically observed upto two days post-treatment for possible side effects.

* On 21st day and again on 40th day post-treatment fecal samples of all animals under trial were subjected to quantitative test by stoll's method.

* A day's milk yield (average of 5 adjoining days) of each animal under trial was recorded at pre-treatment, the 21st day post-treatment and the 40th day post-treatment stages of the trial.

* Blood examination (Hb g % and differential Leucocyte counts) of 8 animals (4 positive, Group X and 4 negative, Group Y in fecal examination at pre-treatment stage) was carried out before treatment and on the 40th day post-treatment.

* The decrease / increase in milk yield and Hb g % levels in animals under trial were differentiated by comparing the pre-treatment levels.

Efficacy of treatment was calculated by the formula :

$$\text{Efficacy in \%} = \frac{\left[\begin{array}{l} \text{No. of animals +ve in Pre-} \\ \text{treatment fecal examination} \end{array} \right] - \left[\begin{array}{l} \text{No. of animals +ve in} \\ \text{Post-treatment fecal exam} \end{array} \right] \times 100}{\text{No. of animals +ve in pre-treatment fecal exam.}}$$

EPG reduction percentage was worked out by the formula :

$$\text{EPG \% reduction} = \frac{[\text{Mean pre-treatment EPG}] - [\text{Mean Post-Treatment EPG}] \times 100}{\text{Mean pre-treatment EPG}}$$

Table I : Incidence of Parasitic Infections*(Figures indicate total number of buffaloes)*

Farm	Total No. of Buffaloes	Positive cases Total No.	positive for Amphistomes	Positive for Strongyles	Positive for <i>Schistosoma</i> Sp.	Positive for <i>Fasciola</i> Sp.	Positive or mixed Infection
A	86	19 (22.09%)	7 (8.14%)	10 (11.62%)	1 (1.16%)	15 (17.44%)	10 (11.63%)
B	14	9 (64.28%)	4 (28.57%)	1 (7.14%)	Nil	8 (57.14%)	4 (28.57%)
Total	100	28	11	11	1	23	14

Observations :

Out of hundred animals screened, 28 % were positive for parasitic infections, the incidence being higher Farm B. 23 % animals were positive for *Fasciola* Sp., 11 % were positive for Amphistomes and 11 % for Strongyle worms. *Schistosoma indicum* infection was present only in one animal. Mixed infection was seen 14 % of animals tested (Table I).

None of the tested animals showed clinical symptoms of parasitic infection.

Treatment with Pantol-C showed efficacy on different parasites on the 21st day post-treatment, 100 % in *Schistosoma* Sp., 91.3 % in *Fasciola* Sp. 90.9 % on Strongyle worms but only 54.54 % in Amphistomes. At 40 days post - treatment, it was found that efficacy was 100 % in all the types of parasites except Amphistomes on which the efficacy was only 54.54 % (Table II).

Treatment with Pantol-C resulted in drastic reduction in EPG counts of all types of parasites. On the 21st day post - treatment

Table II : Efficacy of "Pantol-C Suspension" Treatment in Fluke and Round worm infection in Buffaloes*(Figures indicate total number of buffaloes, found positive in fecal examination)*

Farm (Positive Cases)	Total No. Animals	<i>Fasciola</i> Sp.			Amphistomes			Strongyles			<i>Schistosoma</i> Sp.		
		PrT	PoT 21d	PoT 40d	PrT	PoT 21d	PoT 40d	PrT	PoT 21d	PoT 40d	Prt	PoT 21d	PoT 40d
Farm A	19	15	0	0	7	2	2	1	0	1	0	1	0
Farm B	9	8	2	0	4	3	3	1	0	0	0	0	0
Total	28	23	2	0	11	5	5	11	1	0	1	0	0
Efficacy (%)			91.3	100		54.54	54.54		90.9	100		100	100
Negative Cases													
Farm B	9	0	0	0	0	0	0	0	0	0	0	0	0

PrT : Pre-treatment; PoT : Post-treatment; 21d : 21st Day ; 40d : 40th Day.

Table III : Pre and Post-Treatment EPG in “Pantol-C” Treated Buffaloes

	<i>Fasciola</i> Sp.		Amphistomes		Strongyles		<i>Schistosoma</i> Sp.	
	Mean	Range	Mean	Range	Mean	Range	Mean	Range
0 Day	2367.85	(100-35,000)	3060.7	(100 - 81,000)	271.42	(100 - 2500)	100	100
21st Day Post-Treatment	71.42 (96.98%)	(400-600)	935.71 (69.42%)	(100 - 25000)	3.57 (98.68%)	100	0 100%	0 0
40th Day Post-Treatment	0 (100%)	0	540 (82.35%)	(100 - 18000)	0 (100%)	0	0 (100%)	0

EPG reduction was 100 % of *Schistosoma indicum*, 98.68 % of Strongyles; 96.98 % of *Fasciola* Sp. However, reduction was merely 69.42 % of Amphistomes, On the 40th day post-treatment the EPG reduction was 100% in all except in Amphistome, of which reduction was 82.35 %.

The effect of treatment on milk yield was

noted separately in two groups of animals (X and Y groups). In Farm A, Group X consisted of 19 animals which were positive in pre-treatment fecal examination, while group Y consisted of 9 negative animals which was 5.88 % and 7.82 % respectively.

The increase in milk yield was not uniform in individual animals and there was even

Table IV : Effect of “Pantol-C” Treatment in Buffaloes on Milk Yield in Farm A

Group	Status of Animal	No.Of Animals	0 - Day Pre - Treatment Milk Yield (Litres / Day)		21st Day Post-Treatment Milk Yield (Litres / Day)		40th Day Post - Treatment Milk Yield (Litres / Day)	
			Range		Range	(+/-)	Range	(+/-)
X	+Ve in Pre-Treatment Fecal Exam.	19	5.4 -11.6 (8.354)	-	6.8 - 11.4 (8.710)	+ 0.356 [4.26%]	6.4 - 12.6 (9.214)	+ 0.860 [10.29%]
Y	-Ve in Pre-Treatment Fecal Exam	9	5.0 - 8.8 (6.8)	-	5.0 - 9.8 (7.2)	+ 0.4 [5.88%]	5.0 - 10.0 (7.332)	+ 0.532 [7.82%]

(+/-) : indicates increase / decrease in milk yield from Pre - Treatment.

() : Figures in Paranthesis indicate Mean values.

[] : Figures in Squire brakets indicate increase in Milk Yield in Percent.

In ‘X’ group increase in Milk Yield was noticed in 68.42% animals. No change in 10.52% and decrease in 21.05% animals.

In ‘Y’ group increase in Milk Yield was noticed in 55.5% animals. No change in 11.11% and decrease in 33.33% animals.

Table V : Effect of "Pantol-C" Treatment in Buffaloes on Haemoglobin Levels (Figures indicate Hb g%)

Status of Animal	No. of Animals	0 - Day			40 th Post - treatment		
		Mean	Range	(+/-)	Mean	Range	(+/-)
Group X, +Ve in Pre-Treatment Fecal Exam.	4	8.55	8.2-8.8		10.05	9.4-10.8	+1.5 (17.54%)
Group Y, -Ve in Pre-Treatment Fecal Exam.	4	9.35	8.8-10.6		10.2	9.2-11.4	+0.85m (9.09%)

(+/-) : Increase / Drease in Hb g% levels. Figures in paraenthesi indicate increase in Percent

marginal decrease in milk yield in 21.05 % animals of group X and 33.33 % animals of group Y, while there was no change in 10.52 % and 11.1 % animals in respective groups (Table IV).

Blood examination of 4 animals each of group X and Y before treatment and on the 40th day post - treatment revealed that Hb g % levels were high by 17.54 % and 9.09 % respectively, indicating improvement in general health status of animals (Table V).

Following the treatment, 10 animals out of 28, had loose faeces for two days but soon returned to normal. There were no other side effects.

Discussion :

"Pantol-C Suspension" was highly effective against *Fasciola* Sp. and Strongyle worm infections in buffaloes, while it was partially effective against Amphistomes. These findings are similar to the observations in cattle (Cow) by Narsapur and Hukeri (1997).

The present observations pertaining to sub-clinical cases of parasitic infections in buffaloes, since animals were showing no clinical signs, increase in milk yield and Hb g % levels post-treatment proved two points viz.

1. That sub-clinical parasitic diseases resulted in sub-optimal production and sub-optimal health and
2. That Pantol-C at dose rate used was effective in eliminating sub-clinical infection of *Fasciola* Sp. and Strongyle worms.

Animals in group Y which were negative by fecal examination also showed increase in milk yield and Hb g % levels after treatment with Pantol-C, indicating that many cases of sub-clinical parasitism are missed in routine stool examination.

Hence, in a herd even if few animals were found positive in fecal sample examinations, anthelmintic treatment should be given to the entire herd. In tropical countries like India, where conditions favourable for larval development and transmission of infective stages of parasites are prevailing most part of the year, the parasitic infection are expected to be widespread and it is advisable to adopt " Programmed deworming on herd basis " for round the year to get better production .

Conclusion :

"Pantol-C suspension" @ 60 ml / adult buffalo as single dose treatment is 100 %

effective in *Fasciola* Sp. and Strongyle worms and partially (54%) against Amphistomes.

Treatment of sub-clinical cases with Pantol-C resulted in increase of milk yield from 7.8% to 10.29% and the Hb % levels of animals from 9.095 to 17.54%.

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"If you are in right earnest to be good and pure,
God will send you the 'Sat-Guru', the right teacher.
Sincerity is the one thing necessary."

- Sree Ramkrishna Paramahans

Effect of Ivomec (Ivermectin) Against Mite Infection of Rabbit

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Introduction :

Rabbit is being used as an experimental animal since long. The growing demand and rising cost of traditional meat has posed serious problem so recently rabbit production is gaining momentum as it is considered as potential unconventional source for augmenting meat production in our country. Various microbial disease such as bacterial, fungal and parasitic diseases cause problem of rabbit production (Sinha *et al.*, 1982 & Singh & Khakra, 1991). To have free flock of rabbit it is essential to have rabbits free from microbial infection. The infection with mites is a common problem particularly of ear mite which causes itching and thus restlessness reducing the growth potential of the rabbit (Maske 1998). Hence, there is a growing need for a suitable treatment. The present investigation deals with the mite infection in rabbit flock and its treatment with Ivermectin (Ivomec, Glaxo).

Materials and Methods :

Six experimental rabbits were brought with the complain that these have lost hair on the upper lip and around the nose and ear and

also near the extremities of both hind and fore limbs alongwith chocky white deposits (Fig.1). There were signs of severe itching.

Laboratory Investigation :

Scraping from affected parts were collected on a sterile piece of paper with the help of sterilized scalpel. A 10% potassium hydroxide (KOH) preparation of the collected materials was examined directly under low and then high power of the microscope to detect any parasite or fungal mycelia. Some portion of material was also inoculated on Sabouraud's dextrose agar (SDA) tube and also SDA plates containing chloromycetin (0.05mg/ml) and cyclohexanide (0.5mg/ml) as per conventional method (Ajello *et al.*, 1966). Blood agar plates were also used. The SDA tubes were incubated at 37°C.

10% KOH preparation of the sample neither showed any mycelial fragments nor any budding yeast. However, it showed larval stage of mites and were identified as *Psoroptes cuniculi*. SDA tubes yielded no growth of fungi and dermatophytes until 4 weeks of inoculation and blood agar plates

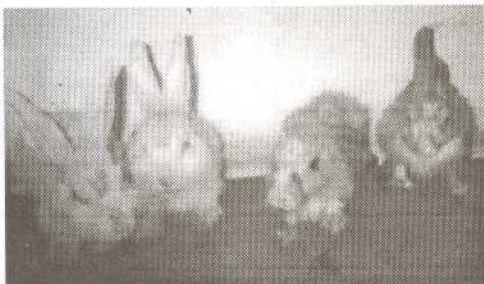


Fig. 1 : Rabbit showing crusty lesions around nose

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also yielded negative for any pathogenic bacteria.

Treatment :

All the rabbits were given Ivermectin (Ivomec, Glaxo, @ 0.25ml/rabbit) by subcutaneous (S/C) injection at 7 days interval.

Results & Discussion :

Psoroptes cuniculi, a mite has been commonly found in rabbits causing skin infection as evidenced by deposition of white crust, scratching and hyperkerationization of skin of the affected part. The clinical picture and lesions simulates the infection by dermatophytes. These can only be differentiated on the basis of direct examination in 10% KOH preparation in order to have the specific treatment. Out of six rabbits, four were completely cured by two injection of Ivermectin (Ivomec) as evidenced by disappearing of crust, shining of affected skin and eruption of new hair

about 7-10 days after the last injection. However, the rest two rabbits who were having extensive lesions around nose, required three injection for the complete disappearance of lesions. No side effect or any allergic reaction was noticed during or/ after Ivermectin injection. However, further work on bigger flock may be helpful in establishing the efficacy of Ivermectin for the treatment of mange (mite infection) in rabbit.

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Clinical Efficacy of orally administered indigenous preparation 'Fertikit' in anestrus buffaloes and Crossbred Heifers

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Anestrus, both postpubertal and postpartum, limits full exploitation of reproductive potential of dairy animals, particularly in rural areas. Since the hormonal therapy for anestrus is very costly, a non-hormonal herbal preparation 'Fertikit' was tested in the present study for its efficacy in induction of estrus.

Materials and Methods :

Fifteen randomly selected adult (6-10 yrs.) buffaloes from the nearby village and ten post pubertal crossbred heifers (> 2 yrs.) belonging to Military Dairy Farm, Bareilly, were included in the present trial during Sept to Dec '97. All the animals were examined gynaeco-clinically twice at 10-12 days interval and confirmed as true anestrus. The animals were administered using single dose 'Fertikit' (Jantana Powder - 10gm on the 1st day, Metrali Powder - 20gm on the 2nd day and Hitali - 2 caps on the 5th day) orally by mixing in feed. The blood samples were collected from each animal and sera was harvested and stored at -20°C for estimation of some macro nutrients by using biochemical kits (Qualigens Diagnostics Pvt. Ltd.). All the animals were then observed carefully daily morning and evening for behavioural signs of estrus and finally confirmed gynaeco-clinically for estrus. The animals in estrus were bred by A.I with frozen and pregnancy confirmed two months later.

Results and Discussion :

Out of 15 buffaloes treated with Fertikit, 7(46.7%) exhibited estrus within 8 to 18 (average 13.57 days). While only 3 crossbred heifers came in estrus and the mean interval of estrus onset was 19-0 days after treatment. Furthermore, the success of conception rate obtained in the study was 67% and 71% for heifers and buffaloes, respectively.

The mean level of serum total protein was 8.70 ± 0.82 and 6.64 ± 0.11 gm per 100 ml in anestrus buffaloes and crossbred heifers, respectively. Serum calcium was slightly higher (non-significant) in anestrus buffaloes (9.36 ± 0.26 mg per 100ml) than in post pubertal heifers (8.8 ± 0.17 mg per 100 ml). However, the levels of serum glucose and inorganic phosphorus were found lower (43.27 ± 11.67 and 4.39 ± 0.71 mg per 100 ml, respectively) when compared with the normal range of serum glucose and inorganic phosphorus as estimated by previous workers (Morrow, 1969 and Kumar, 1986).

Ingredients of Fertikit, specially Metrali and Hitali are well documented for their antibacterial, antiinflammatory, antiseptic, emenagogue and blood purifying properties (Nadkarni 1989). The animals that did not exhibit estrus after treatment implies that these animals might be requiring more of a particular ingredient or might be due to some other causes which have not been included in the present experiment.

From this study, it can be concluded that before therapeutic use of 'Fertikit' a thorough investigation keeping in view of various agro-climatic regions and deficiencies of blood constituents supported by diagnostic aids may be useful in solving the problem of anestrus in rural bovines for subsequent fertility.

Acknowledgement :

The author is thankful to Mycon Pharma, Pune for providing free samples of 'Fertikit'.

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Efficacy of Amnovit in Shrimps Cultivation

C. Gnaneswar,
Bhimavaram, A.P.

Introduction :

Shrimp (*Penaeus monodon*) culture has become a prominent occupation by the farmers, entrepreneurs, unemployed educated youth in Andhra Pradesh. The shrimp production in culture ponds is increasing day by day with the large scale implementation of scientific culture methods. However, problems like, 1. Lack of availability of nutritionally balanced feeds, 2. Chemotherapy for control of viral and bacterial infections, are causing heavy losses to the shrimps industry. Many shrimp feed and medicine manufacturing companies have come up in India to support the shrimp culture industry. The compounded and pelleted shrimps feed are generally formulated based on the knowledge of nutritional requirements of *P.japonicus*, popularly known as Kuruma prawn of Japan. The nutritional requirements of *P.japonicus* was studied by Akio (1995). Essential amino acids profile for prawns were recommended by several authors during 1991 and the same is being followed for *P.monodon* while it is modified for *P.japonicus* (Paulraj, 1995). The recommended supplementation levels for vitamins and minerals in general were given by Akiyama and Dominy, 1989. For many species of shrimps, the required amounts of these nutrients have not been established (Akio, 1995). In India, shrimp species such as *P.monodon* and *P.indicus* are the candidate species for culture practices in earthen dugout ponds.

Amnovit a combination of Aminoacids such as L-lysine, L-methionine, L-Tryptophan and

Vitamins A, D3, E, B2, B12 and K was fed to the shrimp, *P.monodon* to findout its efficacy in improving the shrimps survival and growth rate.

Materials and methods :

The present trial was conducted at Dirusumarru, Kothapoosalamarru and Bondadalanka, West Godavari District, Andhra Pradesh. The size of the trial ponds, stocking densities of shrimp larvae (*P.monodon*) were different in all villages (Table I). The shrimp culture ponds were prepared by 1) Sundrying the soils 2) broadscattering the lime at 250 Kg/Ha 3) enriched the soils with nutrients by application of organic (dried poultry litter) manure at 100 Kg/Ha and inorganic (Diammonium phosphate) manures at 50 Kg/Ha.

In the trial pond, the shrimp larvae were fed with Amnovit mixed compounded feeds. The Amnovit was mixed at the rate of 5 gms/Kg of compounded feed. The larvae were grown to stock size in a period of 20-25 days.

Shrimps growth and survival rate and yield -

The shrimps grown in experimental pond were given Amnovit at 5 gm/kg of the compounded and pelleted feeds. The feeds were given daily for 4 times preferably at 8 am, 12 am, 4 pm and 8 pm. The total daily feed requirements were calculated and given based on the approximate total body weight of the shrimps, present in the pond. The shrimp, grown in control pond, were given compounded and pelleted feeds at the same

rate as in the experimental pond but with no addition of Amnovit. The growth rate of shrimps were noted by taking average body weights. On an average 10% of the total stocked shrimps were collected by using castnet. Sample collections were made at random.

The prevailing physico-chemical parameters of the pond waters were noted every fortnight, throughout the trial period and given in table III. The salinity of the pond

body are likely to have a high nutritive value for shrimps. The shrimps larvae fed on diet containing essential amino acids and vitamins showed good growth and high survival rates (Akio, 1995). In the present study, the obtained results revealed that the percentage of shrimp survival rates (12 to 27%) were high in experimental ponds to that of control ponds (Table I). Amnovit was fed to the shrimp larvae grown in experimental ponds while no extra amino acids and vitamins

Table I : Showing survival rates of shrimps with Amnovil-Supplementation in feed in different trial places.

Name of the village	Ponds size	Stocking number	Survival number	Survival %	Survival difference over the control
Dirusumarru (large size pond)	Experimental 1 hectare	3,00,000	2,20,000	73.3	> 22.7
	Control 1 hectare	3,00,000	1,52,000	50.6	
Kothapoosala marru (medium size pond)	Experimental 0.5 hectare	40,000	26,000	62	> 12
	Control 0.5 hectare	40,000	20,000	50	
Bondadalanka (small size pond)	Experimental 0.5 acre	10,000	6,200	62	> 27
	Control 0.5 acre	10,000	3,500	35	

waters were 10 – 16 ppt, dissolved oxygen 3.0 – 4.0 ppm while the pH of waters were varied from alkaline to (8.0 – 10.0) highly alkaline. The pond waters were maintained in a suitable pH range, thus no water parameters affect the rate of survival and growth of shrimps.

Results and Discussion :

The proteins having an Essential Amino Acid (EAA) profile similar to that of shrimp whole

were administered in control ponds.

The growth rates of shrimps in experimental ponds were high (1 to 7 gms) to that of control ponds and an additional yield of 28 kgs of shrimps were harvested from experimental ponds (Table II). Even there are several claims persist that compounded and pelleted feed, available in the market, possess adequate amino acids and vitamins, it is advisable that products like Amnovit should be used with the feeds to attain higher

Table II : Showing shrimps growth after every 15 days of Amnovil-Supplementation and total shrimps yield

Pond	Shrimps average weights in gms						Total yield in kgs
	Stock size	30 days	45 days	60 days	75 days	90 days	
Experimental	1.5	11	20	23	32	40	160
Control	1.5	8	15	22	30	33	132
Additional weight gain in experimental pond		3	5	1	2	7	28

Table III : Physico-chemical parameters of the pond waters

Parameters	Dirusumarru	Kothapoosalamarru	Bondodalanka
Depth	1.0 – 1.2 m	1.0 – 1.2 m	1.0 – 1.2 m
pH	8.0 – 8.5	8.5 – 9.0	8.5 – 10.0
Transparency	40 cms	40 cms	60 cms
Dissolved oxygen	4.0 ppm	4.0 ppm	3.0 ppm
Salinity	12 ppt	16 ppt	10 ppt

m=Meters : cms=centimeters : ppm=Parts per Million : ppt=Parts per Thousand

shrimps yields.

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“Defer no time; delays have dangerous ends”

- William Shakespeare

Efficacy of Taktic® 12.5% (Amitraz) in Controlling Fish Ectoparasites - *Argulus* sp., *Ergasilus* sp. and *Lerne*a sp. in Carp Culture Ponds of Andhra Pradesh

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Introduction :

Fish ponds in the eastern districts, which are under carp cultures for the last 20 years, of Andhra Pradesh, India have been infested with many protozoan, helminth and crustacean ectoparasites. Of these, *Argulus* sp., a crustacean parasite, popularly known as "Fish lice" is the major damaging factor as far as the farm output is concerned. It infests the soft parts of the body behind fins, in all Indian major carps (*Catla catla*, *Labeo rohita* and *Cirrhinus mrigala*), but very severe on *Labeo rohita*, which generally gives huge and profitable production in mixed culture systems.

Dichloroovas (DDVP), an ectoparasiticide was used in many parts of the world in controlling crustacean parasites (Mc Henery *et al.*, 1992 and Messenger & Esnault, 1992 and Buchinana, 1992) and it's inhibitory action on Acetylcholinesterase (ACHE) at different Dissolved Oxygen (DO) level, reported by Hoy *et al.*, 1992. Azamethiphos' effect on sea lice control (Roth & Richard, 1992) and DDVP on mussels and lobster larvae (Mc Henery & Francis, 1990 and Mc Henery, 1990) was also studied. **Butox**, chemically known as Deltamethrin (Pardhasaradhi *et al.*, 1993) and other synthetic pyrethroids were also regularly used in controlling the ectoparasites (Pardhasaradhi, 1996).

Here it has become a regular practice to use Organophosphorous compounds (DDVP etc.) and Carbamates at intervals of week to fortnight @ 13-15ppm. Repeated infestations at regular cyclic intervals is

being observed in spite of the above said application dosages.

Little much is known about the quantum of lethal effect caused by the usage of Organophosphate and Quinolphos etc., to *Argulus* sp., that are generally applied by the farmers as a control measures in India. Higher efficacy of **Deltamethrin (Butox)** and other synthetic pyrethroid in killing parasite was studied by Pardhasaradhi *et al.*, (1993).

The present experiment with Taktic® 12.5% EC was conducted in controlling / eradicating *Argulus* sp., *Ergasilus* sp. and *Lerne*a sp. in carp culture ponds of Andhra Pradesh.

Materials and Methods :

Five sets of fish ponds of different sizes and same depth were selected (Table I) in and around Gudivada for this trial experiment, conducted during 10.2.98 to 26.5.98 Taktic® 12.5% was applied @ 5ml/acre foot in each pond. Water was collected before and after the application to estimate the planktonic fluctuation, both for their quantity and quality. Controls ponds were not treated with Taktic®. Water from control ponds was also used for plankton analysis.

Argulus Sp. infestation was observed by counting the number of individuals present on the body of fish before and after the application of Taktic® 12.5% EC. Air and water temp, pH and DO were also recorded to find out the stress, if caused during the trial application.

Argullus sp. specimens were collected from the infested fish bodies (*Labeo rohita*) and

were treated at different ppm concentration (0.005, 0.01, 0.02 and 0.05 and 0.0035ppm) in 100 liter jars in the laboratory with Taktic®.

Results and Discussion :

Higher concentrations (0.005, 0.001, 0.02 0.05ppm)of Taktic® 12.5% EC proved to be too toxic for the plankton as all of them died within a minute of application.

Experimental *Argulus* sp. were also totally dead in the ponds as well as in the water samples collected from the same fish ponds. But 0.0035 ppm or 5 ml/ acre foot was found to be toxic to phyto-plankton but Copepods, Cladocerans and Rotifers showed sluggish movements even after 60 minutes.

After six hours the same results were observed. There was no significant fluctuation in the pH or temperature but slight increase of DO in water was observed. After twelve days, the planktonic abundance

were seen with little appendage movements in the beginning and stopped a little later, showing that the parasites may not get killed at the site.

This (0.0035 ppm) strength of dosage looks to be effective because it could make the host rid of the parasites before killing it. Also the most important fish food, Rotifers, Cladocerans and Copepods, were not totally dead, shows that there is every possibility they might re-establish in the pond because Taktic® has only stunned them. The other groups also slowly multiplied to their normal abundance in 12 days, where as *Argulus* sp., could not re-establish itself; being an ectoparasite it needs the host for its shelter and food.

At this (0.0035 ppm) concentration (5ml/acre foot) with pH range of 7.5 to 8.5 can safely be used in fish ponds in controlling *Argulus* sp., infestations as it has not drastically altered the production at primary and secondary levels in ponds. Also a two way

Table I : Showing details of Experimental and Control Ponds Where Taktic® 12.5% EC Was Used

Place	Size Experimental Ponds (Ha)	Size Control Ponds (Ha)	Total Area (Ha)
Nandigamalanka	7 + 7 + 6	2	22.0
Polukonda	5 + 4	1.5	10.5
Sivayyakalu	4	2	6.0
Gudivada	8 + 4	2	14.0
Aripirala	4 + 3	1	8.0
Total	52	8.5	60.5

was found to be same as on the day Taktic® was applied.

Argulus sp. were found to detach totally from the body of the fish, where as in the collected water samples of the same tank the adults

affect is perceived as the eutrophicated ponds with plankton blooms get diluted by the application. The above dose was found effective in removing *Ergasilus* sp., from the gills, and *Learnea* sp., (Anchor worm) from the body parts of catla.

Interestingly 2nd application of Deltamethrin (Butox[®]) 10ml/ acre foot on 3rd day of Taktic[®] 12.5% EC application was found to be more effective in checking the recurrence of *Argulus sp.* up to 45 days.

Precaution :

It was observed that fishes were seen moving virulently near the surface of water where higher doses were applied but without any deaths.

Acknowledgement :

Taktic[®] sample were supplied by Hoechst Roussel vet Pvt. Ltd., Pune is highly acknowledged.

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“When shall I be free ? When that ‘I’ has vanished. ‘I and mine’ is ignorance; ‘Thou and Thine’ is knowledge”

- Sree Ramkrishna Paramhans

Turkey Rearing : A Profitable Project

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Introduction :

Turkey is a poultry bird and is not very popular in Tamil Nadu. The meat is delicious and contains rich protein. Hence, a pilot project for running a Turkey farm was initiated in a private farm.

Pilot Project :

A turkey farm was started at Tapco Grower Farm, Thekkupalayam on 23.08.1996 as a pilot project. To start with 50 Day-old Turkey chicks called as poults were purchased from Regional Poultry Farm (Government of Kerala), Kollam. The breed is Broad Breasted Large White which is a popular and a dual purpose (Egg and Meat) Breed. So Four (4) batches of 50 birds each, were reared and sold.

Method of Rearing :

The poults are reared in chick guards for a month with lighting arrangements, feeders and drinkers provided. The chick mask with good quality protein is a must for the poults. Hence, infertile eggs received from hatcheries (candled) are boiled and fed along with some turmeric powder, which acts as an antiseptics. The requirement of proteins

is about 30% to 32% in feed. The first 4 weeks is a crucial period; wherein a 24 hour watch is essential. The poults used to fall at its back during feeding and drinking because of its body configuration. Pneumonia and coccidiosis are the common occurrence at this stage. Proper hygiene and management will ease this problem.

After a month the poults are fit enough to rear in the broader houses by providing 1 sq. ft area for each turkey. *ad libitum* feeding and watering were provided.

Apart from providing grower mask feed with 30% protein, sufficient amount of greens and chaffed cabbage leaves were given. From this stage onwards, the hatching waste, kitchen waste and market waste were used, after boiling with turmeric powder.

Deworming once in 2 months is essential for the proper weight gains. The vaccination schedule is as follows :

- 1st to 7th Day : Ranikhet Disease Vaccine
F₁ as nasal drops
- 14th Day : Pigeon Pox Vaccine
- 6th Week : Fowl Pox Vaccine
- 8th Week : Ranikhet Disease Vaccine
Kumarou

Table I : Showing Technical Performance of First Four Batches (I-IV)

Details	Batch No. I	Batch No. II	Batch No. III	Batch No. IV
Purchases Made	60	60	41	65
Death	11	25	28	17
Sold	49	35	13	48

The male birds become matured at the age of 8th month and the female matures at the age of 10th month. This is the optimum age for selecting either for breeding or for slaughter.

The death occurred in these batches (especially in batches II & III) were abnormal and the death is not a common prevalence in Turkey (Table I). The further batches after the Batch IV do not suffer mortality and by experience the mortality is fully controlled.

Feasibility :

The Grower Farm, Thekkupalayam is having a capacity of 250 Turkey birds at present.

Cabbage waste, unhatched eggs are the Main feeding and Broiler Finisher feed is also given sparingly. Therefore, the feeding expenditure is very minimum.

For this project, no additional persons were employed. Existing persons who are already in Tapco Grower Farm (whose expenditure is fixed) were utilised for this project.


Conclusion :

Therefore, this kind of small project could be a profitable one. The available manpower in rural areas could be utilised to run this kind of a small profitable project.

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Efficacy of Clomiphene Citrate in Pubertal Anestrus in Hostein Friesian Heifers

M.K. Tandle*, S. N. Hadimani, R. Syed Ameer Ahmed, C. H. Kamkeri. S. D. Dixit, A.G. Kumbar and P. V. Patil.

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Introduction :

Anestrus is the most common form of infertility, generally noticed in cattle. The etiological factors are numerous, complex and interconnected. The present study was carried out to observe the efficacy of Clomiphene citrate for induction of estrus and pregnancy rate in pubertal anestrus HF heifers.

Materials and Methods:

In all, 20 pubertal HF heifers aged between 3-4 years weighing between 250-300kg having history of anestrus were selected for the study. All the heifers were maintained under identical conditions of feed and management practices in a private farm. All these heifers were subjected for gynaeco-clinical examination to sort out anestrus condition. These heifers were divided into two groups. In treatment group (14 heifers) were drenched with 100ml of 1 per cent Copper sulphate solution followed by Clomiphene citrate 300mg (Ar-ex Laboratories Pvt. Ltd.) dissolved in 300ml of water daily for 5 days. The remaining 6 heifers were kept untreated and served as a control group. All the heifers from experimental as well as control groups were observed closely for recording manifestation of estrus signs.

The estrus was detected by parading aproned

bull at 12 hrs interval. Gynaeco-clinical examination was also undertaken for recording changes brought about in the reproductive tract and also that of ovaries. The heifers which showed estrus after treatment were naturally served by breeding bulls. Pregnancy was confirmed per rectally after 60 days of natural service. Statistical analysis was carried out as per Snedecor and Cochran (1968).

Results and Discussion :

From the treatment group, all the 14 heifers (100 per cent) responded to Clomiphene citrate within 11.18 - 7.31 days. All the estruses were of intermediate type. The estrus induction percentage in the present study is in agreement with the findings of Kodagali *et al.*, (1978); Pillai (1980) and Pargaonkar and Bakshi (1989). However, the present findings are higher than that recorded by Singh *et al.*, (1984) and Kurien and Madhavan (1985) who reported 72.70 per cent and 63.64 per cent respectively. The present findings regarding onset of estrus after administration of Clomiphene citrate is in line with the findings of Singh *et al.*, (1984) however the findings are higher than that recorded by Kurien and Madhavan (1985) and Pillai (1980). Out of 14 heifers responded to Clomiphene citrate only one heifer (8.28 per cent) was found pregnant. Similar observation was also made by Pendse *et al.*, (1977),

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however, the present findings were lower than that of Singh et al (1984) and Kurien and Madhavan (1985) who recorded 87.50 and 30.30 percent conception rate respectively. None of the heifer from control group manifested any estrus signs during the period of experiment.

The variation in the results may be due to unovulatory estrus, difference in individuals, hormonal level, breed, environment, nutrition etc.

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Effect of Dietary Supplementation of AMNOVIT on Broilers Performance

Siddaramanna and H.B. Asha

No. 830, IX Cross Road, Indiranagar, II Stage, Bangalore

The broilers were succumbed to various kind of stresses due to intensive production pressure in the present farming system, which adversely affect their productivity performances. The dietary use of Vitamins and Aminoacids are gaining popularity in recent times to combat stresses, because of their beneficial effect on growth rate, feed efficiency and feed conversion.

Aminoacids and vitamins supplemented in broiler diet may serve as growth promoters. In view of the above a field trial was conducted to test the efficiency and cost benefit of Amnovit (Hoechst Roussel Vet Pvt. Ltd.) in commercial broilers.

Materials & Methods :

A total of 612 (six hundred and twelve), day-old Cobb broiler chicks were distributed at random to three dietary treatment groups of 204 chicks each. One group was kept as control with standard broiler feed only but without Amnovit. Other two groups were kept with standard broiler feed, supplemented with Amnovit 500 gms/1000kgs (Treatment-1) and Standard broiler feed supplemented with 1000 gms/1000kgs (Treatment-2). All these groups were reared under similar managemental conditions. Feed and water were provided *ad libitum* throughout the experimental period of 42 days.

Body weight, mortality, feed consumption and feed conversion ratio (FCR) were recorded for all the groups at weekly intervals.

Results and Discussion :

The effect of Amnovit supplementation on various parameters of broilers is presented in Table I & II. The livability in treated groups was 98.03 % (T-1) and 99.01% (T-2) as compared to Control i.e 96.57%. Birds in all the groups attained more than average body weight (1.5 kg at 6 weeks), but the treated groups achieved higher average live weight of 35 gm (T-1) and 55 gm (T-2) per bird more than the average for Control birds. The feed consumed per bird was lower by 333 gm (T-1) and 370 gm (T-2) in treated groups and their F.C.R. of 1.974 (T-1) and 1.932 (T-2) was better than 2.20 in the control group.

The cost benefit analysis of supplementation with Amnovit in commercial broilers is presented in Table III. In economic terms, the income due to Cost of production per kg bird compared to control worked out to Rs.1.59 (T-1) and Rs.1.73 (T-2).

The findings of present field trial indicate that the use of Amnovit in broilers as growth promoter improves profitability through better feed efficiency, faster growth rate and reduced mortality.

It is evident from the present findings that Amnovit can be used at the rate of 1000 gms/Metric Ton of feed regularly in broilers from 0-42 days.

Table I : Showing effect of Amnovit supplementation in feed on performance of Broilers

Sr. No.	Parameter (Weight in gm)	Control Group	Treatment 1 Group	Treatment 2 Group
1.	Day old chicks weight	40.50	40.50	40.50
2.	7-days body weight	152.00	147.00	149.00
	*Feed consumed between 0-7 days	158.00	194.00	178.00
	*Livability %	99.50	99.50	99.01
	*Gain of Body weight between 0-7 days	111.00	106.01	108.50
3.	14-days body weight	315.00	335.00	350.00
	*Feed consumed between 8-14 days	349.00	274.00	314.00
	*Livability %	98.03	99.50	99.01
	*Gain of Body weight between 8-14 days	163.00	188.00	201.00
	*Cumulative feed/bird	507.00	468.00	492.00
4.	21-days body weight	615.00	625.00	625.00
	*Feed consumed between 15-21 days	800.00	700.00	700.00
	*Livability %	97.54	99.01	99.01
	*Gain of Body weight between 15-21 days	300.00	290.00	275.00
	*Cumulative feed/bird	1307.00	1168.00	1192.00
5.	28-days body weight	915.00	915.00	920.54
	*Feed consumed between 22-28days	675.00	568.00	553.00
	*Livability %	97.54	99.01	99.01
	*Gain of Body weight between 22-28 days	300.00	290.00	295.00
	*Cumulative feed/bird	1982.01	1736.00	1745.00
6.	35-days body weight	1337.00	1350.00	1365.00
	*Feed consumed between 29-35 days	934.00	907.00	871.00
	*Livability %	96.57	98.03	99.01
	*Gain of Body weight between 29-35 days	422.00	435.00	445.00
	*Cumulative feed/bird	2916.00	2643.00	2616.00
7.	42-days body weight	1785.00	1820.00	1840.00
	*Feed consumed between 36-42 days	1010.00	950.00	940.00
	*Livability %	96.57	98.03	99.01
	*Gain of Body weight between 36-42 days	448.00	470.00	475.00
	*Cumulative feed/bird	3926.00	3593.00	3556.00
	FCR	2.20	1.974	1.932

All values are average of 204 birds in each group

Table II : Showing Summary of Results of the Trial

Sr. No.	Parameter	Control	Treatment 1	Treatment 2
1.	Day old chick weight (gms)	40.50	40.50	40.50
2.	Body weight at 42 days (kg)	1.785	1.82	1.84
3.	Total feed consumed / bird (kg)	3.926	3.593	3.556
4.	Livability %	96.57	98.03	99.01
5.	F.C.R.	2.20	1.974	1.932

Table III : Economics of Feeding Amnovit to Broilers

Sr. No.	Parameter	Control Group	Treatment 1 Group	Treatment 2 Group
1.	Cost of Chick Rs.13.65	13.65	13.65	13.65
2.	Over head expenses Rs.5/bird	5.00	5.00	5.00
3.	Cost of feed Rs.8/kg Total cost of feed	(8x3.926) 31.408	(8x3.593) 28.744	(8x3.556) 28.448
4.	Cost of Amnovit Rs.340/kg *500 gms/1000 kg i.e. 17 paise/kg Total cost of amnovit / bird *1000 gms/100 kg i.e. 34 paise /kg Total cost of amnovit / bird		(17x3.593) 0.61	(34x3.556) 1.209
5.	Total cost of production /bird	50.058	48.004	48.298
6.	Cost of production per kg live weight	27.96	26.37	26.24
7.	Saving in production cost/kg		1.59	1.73

Results and Discussion :

The effect of Amnovit supplementation on various parameters of broilers is presented in Table I & II. The livability in treated groups was 98.03 % (T-1) and 99.01% (T-2) as compared to Control i.e 96.57%. Birds in all the groups attained more than average

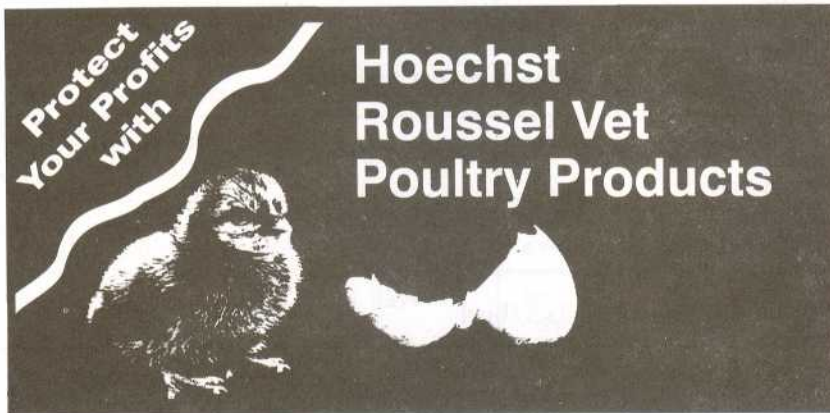
body weight (1.5 kg at 6 weeks), but the treated groups achieved higher average live weight of 35 gm (T-1) and 55 gm (T-2) per bird more than the average for Control birds. The feed consumed per bird was lower by 333 gm (T-1) and 370 gm (T-2) in treated groups and their F.C.R. of 1.974 (T-1) was better than 2.20 in the control group.

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broilers as growth promoter improves profitability through better feed efficiency, faster growth rate and reduced mortality.

It is evident from the present findings that Amnovit can be used at the rate of 1000 gms/Metric Ton of feed regularly in broilers from 0-42 days.



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- Infectious Bursal (Gumboro) Disease Vaccine (Living) B.P. (Vet) Intermediate Strain
- Infectious Bursal (Gumboro) Disease InterPlus Vaccine (Living) B.P. (Vet) Invasive Intermediate Strain
- Infectious Bronchitis Vaccine (Living) B.P. (Vet) Mass Type
- Fowl Pox Vaccine (Living)
- New Castle Disease Vaccine Inactivated B.P. (Vet)
- Infectious Bursal (Gumboro) Disease Vaccine Inactivated B.P. (Vet)

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Dry Preservation of Insects – an Alternative Approach

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Dry preservation of adult insects is preferred to preserve the important morphological features like setae, antennae, spines, bristle or even the colour for proper identification by pinning. The pin is fixed through the thorax (Technical Bulletin-18, 1971) to median aspect of insect preferably on median line carefully to keep the most important characters undamaged and then fixed on a cork board in an entomological specimen box (Walker, 1994). However, it always needs a special type of pins which are comparatively costlier and one has to depend on entomological equipment supplier. Moreover, by these pins, small insects like adult mosquitoes are difficult to preserve because very thin pins are not yet available. The supplied pins also get easily rusted particularly in high humid areas near sea shore because of salty weather. On the other hand, entomological specimen box containing the cork board is also very costlier and conventionally, chemical impregnated baits inside the box are to be kept to preserve the specimen from cockroach, ants and others and has to be replaced periodically till odour of chemical exists in baits. To overcome the problem and minimize the cost of preservation of soft bodied insects, even very small ones, in the present report, few modifications are made over the conventional process.

Materials and Methods :

The following alternative approaches were attempted :

- (a) Instead of using conventional pins, the small pieces of waste plastic coated electric copper wires of half to one inch long, as per requirements was used. According to size of insects, wire of different thickness could be used. The groups of wire were removed from the plastic coated covering and were cut into small pieces. One end of the wire was twisted into a loop similar to microbiological wire loop, before passing the other end through the thorax, either on dorsal or ventral side of insect.
- (b) Rather than using the costly cork board for fixing the insects inside an entomological specimen box, easily available thermacole was used as another easy alternative.
- (c) Instead of using the costly chemical impregnated baits inside the insect box, naphthaline balls, either powdered or as a whole, were found very useful. However, its direct contact could melt the thermacole sheets but this could be avoided simply by covering the thermacole pieces by a white writing paper and should be sealed from all the sides, using any glue like fevicol, putting it at the corners of the paper only. Pasting of glue on the whole surface of the thermacol should be avoided to keep the outer surface even.
- (d) Alternative to the carding process, audio cassette cover or even shaving blades plastic container could be used to preserve the insects for display or routine use. The thorax part was fixed on the

wall of the box with a tiny drop of Fevicol, keeping the dorsum in upright position. The cassette or shaving blade's covers were then sealed permanently with glue followed by adhesive tape without using any insecticide bait or even naphthaline balls.

- (e) Small plastic specimen tubes were also found suitable to preserve the insects in a rows wither dorsal or ventral aspects of preserved insects. Small thermacole piece sealed with white paper was put inside the tube and then insects were fixed with copper wire and lastly tightly sealed with lid, by adhesive tape without using any baits or naphthaline powder. But if for practical demonstration, specimen to be removed again and again, putting the naphthaline powder is found effective.

Results and Discussions :

The present study revealed that waste electric copper wire was very useful to preserve the insects and it could penetrate the soft tissues of thorax even after few hours of killing the insects using wet pad of either chloroform, carbon tetrachloride or ethyl acetate. Because of its thin size, it causes minimum tissue damage of insect and thus maintain morphological features mostly intact. Moreover, it never get rusted even in most humid areas or even in seashore areas. Themacole pieces are comparatively cheaper than the cork board and can be used of any thickness according to requirements. Similarly, naphthaline balls are very cheap than the other chemicals like malathion, sumithion etc. and has no hazardous effect too. However, during sealing the thermacole, it is advisable not to use ordinary gum or

glue as it attracts ants and cockroaches. Audio cassette cover or shaving blade's plastic box, which are commonly put in dust bin are of great use with minimum expenditure. The results also revealed that when glue was used to fix the thorax of insects and then sealed permanently without using naphthaline, insects could be maintained years together. This also simplifies for the carding process and avoids conventional use of tragacanth gum (Technical Bulletin-18, 1971) or Cellulose acetate cement (Fenemore and Alka 1992). This process, however, allows to study the morphological features of one side only which is in upright position. To overcome this, two insects can be fixed in alternate position (one on dorsal aspect and other on ventral aspect of thorax) with glue.

Acknowledgement :

Authors are thankful to the Dean, Rajiv Gandhi College of Veterinary & Animal Science for providing facilities and to our student, J. Joseph for his constant co-operation.

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Case Report : Role of Enrofloxacin (Floxin) in Horn Cancer, Horn Fracture and its Efficacy in Wound Healing

A. K. Singh

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Introduction :

In India, the dehorning practice is not so common except, in cross bred animals (calf), specially female one. The horn of bullock and buffalo look good than dehorned. But in an accident when the horn is broken from the base or from any portion, dehorning is needed. After the operation, Enrofloxacin (Floxin 10% vet) from Hoechst Roussel Vet, was used to combat post-operative secondary microbial infection and found excellent response in reference to quick healing.

Case Report :

At veterinary hospital, Bairia in Ballia district and thereafter at Azamgarh district, several cases of horn cancer and horn fracture were recorded. The animals were processed for surgical operation. All necessary instruments were sterilized. The operation conducted under generalized sedative xylocain (cadilla), xylazine (Merind) and cornual nerve block by xylocain with Adrenaline 2%. After taking all pre-operative measures, the operation was conducted aseptically. Bleeding was checked by ligation with catgut (nonchronic). Ciprofloxacin powder (Lixen) from Glaxo was applied in operative area and sutured. Povidone iodine solution was also used externally.

Injection Enrofloxacin (Floxin 10% vet, from Hoechst Roussel Vet) was administered for 7 days with other supportive treatment.

Result :

The animals were kept under minute observation for 7 days and found that the wound healing was excellent. After the 7th day, only antiseptic dressing was advised. Sutures were cut on 11th to 13th as per the owner's convenience.

During the treatment, it was observed that the animal was off-fed for 24 to 36 hrs due to stress, but soon after, they all recovered. The nasal discharge along with blood serum was cleared after 72 hrs and no animals have had any adverse effect on health, vigour and feeding. Milk of the buffalo decreased due to post-operative stress but recovered after 5th to 7th day with supportive therapy.

Acknowledgement :

The author thanks Mr. Pradip Goenka, Sales Officer, Hoechst Roussel Vet, HQ Varanasi, for providing Floxin sample for completion of the treatment.

Case Report : Therapeutic Efficacy Of *Diaroak* in Clinical Cases of Ruminant Non-specific Diarrhoea and Calf Scours.

K. Satish Kumar

Department of clinical medicine, College of Veterinary Science, Tirupati, A.P.

The common manifestation of Gastrointestinal disturbance in ruminants of all age of groups is diarrhoea, which is characterised by passing loose watery dung several times, leading to excessive loss of fluids and electrolytes resulting in dehydration, reduced milk yield in lactating animals, loss of weight and going down in condition. Intestinal malabsorption, hypersecretion, abnormal peristalsis and erosion of gut mucosa are the non-specific conditions, which may cause diarrhoea, apart from several specific etiological agents (Radostits *et al.*, 1994). Though diarrhoea will cause only morbidity in adults, it is a common cause of mortality in young calves, sheep and goats (Minett, 1950). Therapeutic studies of herbal antidiarrhoeal agents in clinical cases is scanty and scattered in India. Therefore this report is aimed to study the efficacy of herbal antidiarrhoeal, DIAROAK dry suspension (Dabur Ayurved Ltd.) in non-specific diarrhoea of ruminants and calf scours.

The trial was carried out for a period of 40 days at veterinary dispensary, Dummuguden in Khamman district of Andhra Pradesh. A total of 21 buffaloes, 29 cattle and 12 calves

were reported to be suffering from diarrhoea. Dung samples of all the animals were examined under microscope as per the standard methods and 12 Buffaloes and 14 cattle were diagnosed to be having diarrhoea of non-specific etiology and 7 calves with calf scours. In all the cases severity ranged from mild to very severe diarrhoea of 1-2 days duration, before the start of therapy. All the animals of non-specific diarrhoea and calves with calf scours were treated with a polyherbal preparation Diaroak (Table 1). Therapeutic efficacy was assessed in terms of time taken for complete clinical recovery.

All the cattle and calves were fully recovered in 3.5 days whereas all the buffaloes required 4 days treatment for complete recovery. All the calves took equal duration with adult cattle to recover which might be due to the presence of *E.coli* beyond other diarrhoea associated pathogens in calves.

Among the polyherbal components of Diaroak, *A.paniculata* has antimicrobial actions as herbal alternative to antibiotics (Low, 1995) and another ingredient *Halorrhoea antidysenterica* which is amoebicidal astringent and antibacterial agent (Lahiri and Dutta, 1967) might be responsible

Table I : Showing Therapeutic Efficacy of Diaroak.

Species	No. of Animals	Dose per day	Average period (days)
Buffaloes	12	30g x 2	4
Cattle	14	30g x 2	3.5
Calves	7	10g x 2	3.5

for correcting calf scours. Of the other ingredients, *Punica granata* is documented as astringent in diarrhoea and dysentery (Satyavati and Gupta, 1987). Beyond these, the herbal constituents have soothing action on the intestines through reduced peristalsis, absorption of enterotoxins and protective coating over mucosa along with antisecretory activities (Vihan, 1997).

Diarioak was found to be highly efficacious herbal antidiarrhoeal, in treating non-specific diarrhoea in ruminants and calf scours, thereby prevents serious loss of electrolytes and fluids.

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Animal	Body weight kg	Dose
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Case Report : *Demodes cannis* Infection in Dog and its Successful Treatment

A. K. Sharma, R.K. Mandial and Dinesh Parmar

Veterinary Clinics, College of Veterinary and Animal Science, Himachal Pradesh Krishi Vidyapeeth, Palampur, (H.P.)

Demodes cannis is a mite which lives in hair follicle and sebaceous glands of the skin and causes demodectic or follicular mange.

A male five year old dog with a history of itching, alopecia (developed 5-6 days before on the body) and brought to the clinics. According to the owner, the disease reoccurred after an interval of 10 – 12 months. Different topical applications were tried but of no response. The Dog was vaccinated against rabies.

Clinical examination revealed normal temperature, moderately higher heart rate and pale conjunctiva. Examination of the skin revealed dry skin lesions in the form of irregular inflammatory patches on the abdomen, inside of legs, on the face, elbow and feet. There was loss of hair, thickening and wrinkling of the skin. Hair were brittle in appearance. Haematology of the case revealed anaemia, eosinophilia and relative lymphopenia. Skin scrapings were collected from the body parts for microscopical examination in 10% KOH and in sterilised containers for microbiological investigations.

Laboratory examination of the skin scrapings indicated the presence of *Demodes cannis* infestation. Microbiological examination found negative for any fungal growth. Clinical examination and laboratory examination confirmed it is a case of demodectic mange.

Hair around the skin lesions were clipped till the normal skin was exposed and washed with salvalon 2% and allowed to be completely dried. Benzylbenzoate was

applied topically on the lesions. Betadine was applied to combat the secondary bacterial infection. Injection Ivermectin was given 0.03 ml S/C and the owner was asked to report on the 5th day of post treatment. Avil injection (Hoechst Roussel Vet) was administered on the same day to reduce the itching (Chakravarti, 1993).

On the 5th day, there was improvement in the skin coat and itching was reduced markedly. Feeding of the dog was normal and appeared to be alert. Examination of the skin scrapings after the treatment did not reveal any presence of mites. Skin showed the new growth of hairs. The case was discharged on the 7th day after giving another injection of Ivermectin (0.03 S/C) and the owner was advised to give supportive treatment with skin tonics such as Prepalin Forte (2 ml I/M) on alternate day for 5 day and Acetylarson 9.4% of 1ml S/C, for 3 days.

Acknowledgement :

Authors are thankful to the Dean COVAS, HPKV, Palampur for providing the facilities.

Reference :

Chakarbarti A. (1993). A text-book Preventive Medicine. **First Edn.** Kalyani Publishers, Ludhiana.

Case Report : Lipoma in a Dog

M. B. Bhanage

Animal Husbandry Department, Gokhale Nagar, Pune

A Labrador retriever female dog aged three months was brought with swelling and open wound on lateral side of left hind leg below metatarsal. History revealed that the wound was caused due to hitting a table edge while jumping.

On clinical examination, the swelling was measured 2 x 2 x 1 cm with mass feeling and having scanty bloody discharge from the wound. The animal was feeding normally and showed no limping and pain on palpation. The temperature and pulse were within normal limits. The paracentesis of the growth revealed nothing, ruling out the possibility of a cyst or hematoma. Medicinal treatment (NSAIDs) showed no effect on the growth. Therefore, surgical approach was attempted.

The dog was restrained and local analgesia was given at the base of the mass. After opening and blunt dissection of the skin, nothing except fatty tissue was seen. The mass was scraped and sent for histopathological examination, which revealed lipoma. Post-surgical healing was uneventful.

Discussion :

Dogs and cattle are naturally prone to neoplasms than other domestic animals.

Tumors can develop on body even due to minor single trauma. Lipoma, a benign fatty tissue tumor can occur in subcutaneous tissue of neck, shoulder, back and buttocks. It is soft, circumscribed, lobulated, encapsulated tumor which can be moved manually. Such tumors are not common in dogs and are generally attributed to heredity or nutritional status. High protein diet and inadequate exercise promotes obesity making them vulnerable to lipoma. In the present case, the lipoma was movable and pedunculated. These tumors occur as subcutaneous masses of varying sizes and shapes, invading fascia and muscular area, which can be removed surgically without chances of recurrence. Present case matches with these findings of other earlier workers.

Microscopically, the size and shape of the fat cells found in lipoma vary from normal, which could not be ascertained in this case. Also reasons for such sudden development in young dogs could not be traced.

Acknowledgements :

The author is thankful to Dr. D.D. Kale, Principal, Inservice Diploma Course, Gokhale Nagar, Pune for his critical suggestions.

“Charms strike the sight
But merit wins the soul.”

- Pope

Case Report : Omasal Impaction in Cross-Bred Cow

Neelu Gupta and V.K. Gupta*

Department of Pathology, College of Veterinary Science and Animal Husbandry, Anjora, Durg, M.P.

In the present case, a cross-bred cow about three and half years of age was received for post-mortem in the department of Pathology, College of Veterinary Science & Animal Husbandry, Anjora, Durg. During that post-mortem, it was noted that the cause of death must have been due to "Impaction on omasum with hepatitis".

As per the owner, cattle showed symptoms of restlessness, dullness, anorexia for about 3-4 days before death. Necropsy revealed omasum was hard, rounded, enlarged and tightly packed. Omasum contains dried ingesta. Omasal leave showed necrotic patches. Abomasum and intestine had no ingesta, body muscle was absolutely dry. Liver showed hepatitis and lung showed congestion.

Previous workers also showed omasal impaction developed along with Peritonitis and also with Hepatitis (Randhawa *et al.*, 1996). In the present case, the cause of death may be impaction of omasum. Randhawa *et al.*, (1996) suggested proportion of feeding materials and concentrate might not be actual cause of impaction of omasum. However, some other

unknown dietary factors affect the function of the gastro-intestinal tract. Radostits *et al.*, (1995) suggested impaction of omasum occurs when feed is tough and fibrous, specially alfalfa stalks and loopings from fodder trees. It also developed due to accumulation of soil in the omasum. The exact cause of impaction of omasum in the present observation could not be established. The cause of death may be either due to toxicity, bacterial, viral infection or may be defects in feed.

Acknowledgement :

The authors are grateful to the Dean, College of Veterinary Science and Animal Husbandry, Anjora, Durg (M.P.) for the facilities provided.

References :

- Radostits, O.M.; Blood, D.C. and Gay, C.C., (1995). *Veterinary Medicine*, 8th edn. Bailliere Tindall, London
- Randhawa, C.S.; Bansal, B.K.; Singh, K.B. and Nauriyal, D.C. (1996). *Ind. Vet. J.*, 73:205.

* Government Cattle Breeding Farm, Anjora, Durg, M.P.

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Bombay Veterinary College, Parel, Mumbai
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e.g. Chhabra, D., Moghe, M. N. and Tiwari, S. K. (1996). *Ind. Vet. J.*, **82** : 1-3.
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Book Review :

“Guide Book for Veterinarians”

By

D. N. Pandey and Amita Bajpai

Publisher - Kalyani Publishers

B-I/1292, Rajinder Nagar, Ludhiana

Veterinary medicines especially clinical veterinary medicines need constant updated, in view of introduction of various new molecules / products by pharmaceutical companies. This is also due to re-emergence of alternative system of medicines like Ayurvedic, Homeopathic etc. in veterinary practice. The young veterinary graduates as well as practising veterinarians always are in need of a book like ‘Guide Book for Veterinarians’ for quick reference of drugs for preventing and treating various ailments in livestock.

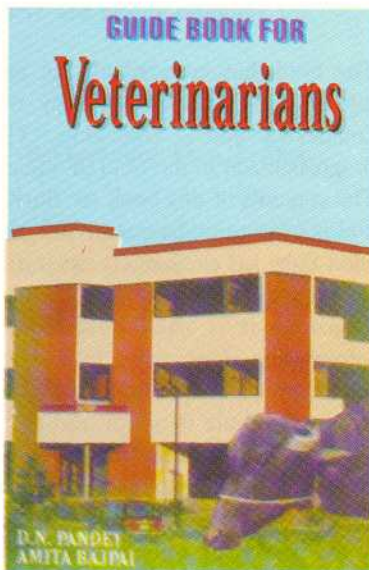
The authors, Dr. D.N. Pandey and Dr. Amita Bajpai have brought out this interesting book which will be very useful to the veterinarians. The Book has twelve chapters out of which, five chapters were allocated for list of medicines of Allopathic, Ayurvedic, Homeopathic, Biochemic remedies, Veterinary biological and Pet products. The Homeopathic and Biochemic remedies are of new and will be of interest to veterinarians.

The book also provides useful information especially to the young veterinary graduates that how they shall prepare and approach for IAS and PCS examination. Tips on subject like ‘how to manage boss subordinate relationship’ has also been discussed efficiently for the candidates who are already in the service

It is indeed nice of the authors to cover up important invention and discoveries related to the field of veterinary sciences and have also listed down the eminent veterinary personalities.

Certain products, listed down in this book are discontinued long back, the authors should have taken care in eliminating the same.

Over all, the book will be definitely useful for young veterinary graduates and practising veterinarians and also to the veterinarians in the related industries.



Reviewed by :

Dr. V. Velan

General Manager, Bussiness Development,

HR Vet Pvt. Ltd, Airport Road, Pune

Book Review :

“Aquaculture in India”

By

C. Gnaneswar and C. Sudhakar

Published by : Smt. C. Vijaya Lakshmi

7/204 & 7/205, Court Road, New Town, Anantapur

The book has covered all the basic information about aquaculture and written very well by the authors, C. Gnaneswar and C. Sudhakar. The authors discussed the progress made in the field of aquaculture comprehensively. The contents of this book are illustrated in simple language and is easy to understand. Classification of fin fishes and shell fishes is exclusively magnificent. There was a need to emphasize the circular Chinese Hatcheries more in detail as it is the latest field of interest. Enough information is provided by the authors about culture of fishes, prawns, crab, edible oysters, lobsters. The note on the pearl culture is worth reading. Prevention and control of diseases is very nicely presented. Under fish preservation, a note could be added on fish canning. The chapter of breeding of ornamented fishes is nicely narrated in the book. Few more coloured photographs would have been useful to make the book more presentable.

The book will be very useful to any person interested in Aquaculture and should be a must for college and all libraries.

Reviewed by :

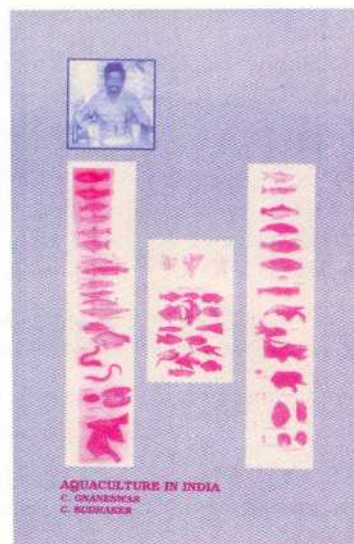
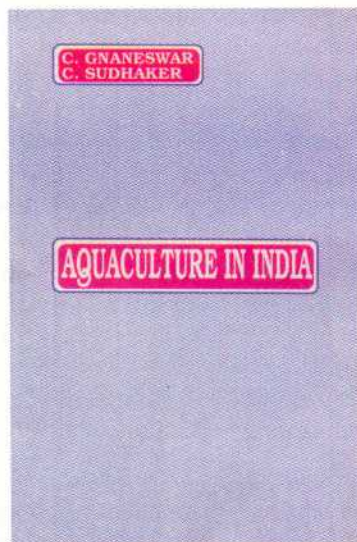
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Fisheries Faculty

Tarporewala Marine Biological Research Station

(Konkan Krishi Vidyapeeth)

Mumbai



“God is in all men, but men are not in God,
that is the reason why they suffer”

- Sree Ramkrishna Paramhans

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Veterinary Officer, Darbhanga Dairy, Mohalla-Faizullah Khan, P.O. Darbhanga, Bihar.

I like this issue because this issue has included a valuable article on Paraamphistomiasis. Please include an article on Fascialcasis in cattle and an article on F. M. D. Vaccination. There are major problems for the farmers, specially in Milch Cattle.

2. Dr. P. C. Pandey

B.V.Se & A. H., Laxmi Chowk, P. O. M.I.T. Brahampura, Opp. Sanker flour Mill, Muzaffarpur 142003, Bihar

I like this issue because "A new technique for repair of Umbilical Hernias in male calves. I performed an Umbilical operation by this technique and got satisfactory result.

3. Dr. Chanchal Bhattacharya, V.A.S.

Veterinary Hospital, Bhati Mines, Mehrauli, New Delhi - 110030

I like this issue because I got valuable information about Tactic® 12.5% EC (Amitraz). It gives immense importance to the field problems, which help us i.e. field veterinarians to keep ourselves upto date. I want to send my article related with field problems in Delhi.

4. Dr. Jagdish Singh

Veterinary Officer Incharge C. H. V., Mahilpur (Hoshiarpur).

I like this issue because it is informative and refreshing field vet's knowledge, who are devoid of recent technical advances and update technical knowledge because of in remote areas. I like the article "A new Technique in Respect of Repairs of Umbilical Hernias in Male Calves.

5. Vipin K. Verma

Veterinary Pharmacist, Civil Veterinary Dispensary, Mirthal, Dist. Gurdaspur (Punjab).

I like this issue because of the article - 'Efficacy of Lavamisole alone and with Butox (Deltamethrin) against Sarcoptic Mange in Sheep' and 'Studies on the Paramphistomiasis in cattle and its treatment with Tolzan - F'.

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6. Dr. A. K. Singh

Veterinary Officer, Bahadurpur, Allahabad, U.P.

I like this issue because some articles are useful in clinical practices. The value of this book will increase if you start publishing one or two review articles on various diseases discussing its Aetiology, Epidemiology Mode of infection, Pathogenesis, Clinical symptoms, Post Mortem findings, Treatment and control etc. in every issue. It will refresh the knowledge of field Veterinarians.

7. Dr. Tulsidas Nathani

1 - CHH - 2, Dadabari H. B., Kota 324009, (Rajasthan).

I like this issue because it provides valuable information which is useful for field veterinarians. The control of Foot and Mouth Disease in India has become an important issue, which also needs initiation of the state Governments for implementation of rules, made by the Central Government, in exercising the powers, conferred by Prevention of Cruelty Act, 1960 - Transport of Animals Rules, 1978.

8. Dr. Arvind Kumar Singh

Veterinary Officer, Veterinary Hospital, Azmagarh Estate, P.O Azmagarh Estate, Azmagarh, U.P.

I like this issue because it is much informative and veterinarians are in position to know practical field trials at grassroute level where it is too hard to get.

Article - 'A new Technique for Repair of Umbilical Hernias in Male Calves' is very much useful for field veterinarians. Thanks to Dr. A. K. Datta (Editor), for generating new ideas for betterment of veterinary practice.

9. Dr. Fakhruddin

Senior Assistant Professor (Veterinary Medicine), behind Masjid ki Gali, Mohallah Choongaran, Bikaner 334005 (Rajasthan)

The articles particularly 'Status of Vaccines Against Parasites in Ruminants', and 'Strongyloidosis in Canines : an Overview' are broadly informative and useful to the scientists and practising field veterinarians. Other articles on field oriented drug trials and Case Reports are also good and informative.

Suggestions - Articles on Veterinary Forensic Medicine should also be included in this popular publication.

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