HISTORY OF ESTABLISHMENT

There had been a feeling that very little efforts were made to promote live stock production and wealth, besides need based research and extension under sub mountain, temperate and sub-temperate conditions of Himachal Pradesh. There was also a general consensus that a tremendous scope for livestock development including education and research, besides conservation of natural germplasm of typical species like chamurthi horses Yaks, Gaddi sheep, goats, hill cattle and a variety of wild species of fauna (animals and birds), which otherwise could not be better looked after by the veterinarians trained in other parts of the country. The gap was also very wide in livestock resources available in the State *vis-a-vis* the qualified human resources to provide efficient veterinary health cover in this hilly state. The HPKV constituted an expert committee in consultation with the Indian Council of Agricultural Research for assessing the establishment of a Veterinary institution. The committee consisted of Deputy Director (Animal Science) ICAR, Vice-Chancellor, HPKV, Director, Animal Husbandry, Govt. of H.P., Dean, College of Veterinary Sciences, HAU, Hissar; Dean, College of Veterinary Sciences, GB Pant University of Agriculture and Technology, Pantnagar, Director, NDRI, Karnal,

Dr. S.P. Arora, Professor of Eminence; Dr. A. C. Mathew, ADG, ICAR; Dr. B.S. Gill, Special Director of Research (Animal Sciences), PAU, Ludhiana, Dr. O.P. Awasthi, Dean, C.O.A., HPKV and Dr. M.P. Narang, Head, Department of Animal Production, HPKV, Palampur. This committee held its meeting on 19th December, 1985 at HPKV, Palampur and recommended the establishment of a Veterinary College at Palampur as a model Veterinary College for hilly regions of the country by appreciating the available infrastructure in the erstwhile department of Animal Production of the University. Thus, the College of Veterinary and Animal Sciences (COVAS) was established by the State Government in July 1986 and it was duly accredited by the ICAR and approved by the Board of Management of the University with the following six composite departments:Animal Production,Anatomy and Histology,Veterinary Physiology and Pharmacology, Veterinary Microbiology, Pathology and Parasitology,Veterinary. Surgery and Gynaecology and Veterinary Medicine

The livestock farm was proposed to be strengthened further for teaching of Veterinary Sciences subjects. Biochemistry, Economics and Statistics, Extension Education and forages were to be taught in collaboration with the College of Agriculture. Considering the significant importance of the fisheries in the State, the fishery section was also considered to continue to be the constituent section of the erstwhile Department of Animal Production.

THE COLLEGE :

Seven more departments were created in July, 1991 thus raising the strength

of departments from six to thirteen. Now all the major disciplines are separate and independent working for the balanced and all round development of individual disciplines. The College has now 18 independent departments in operation and two independent Service Windows i.e. Livestock Farms and Veterinary Clinic.

The College imparts instructions to undergraduate students for four and half years plus six months of rotational compulsory internship programme leading to

the degree of Bachelor of Veterinary & Animal Sciences. The first batch passed out in January, 1991.The students are selected on the basis of a common entrance test. The college also offers postgraduate instruction leading to M.V.Sc. in 13 disciplines and Ph.D degree in six disciplines (Animal Breeding, Animal Nutrition and Veterinary Surgery and Radiology, Veterinary Microbiology, Veterinary Medicine Ethics and Jurisprudence and Veterinary Anatomy).

The College, in its existence of 18 years, has adequate infrastructural facilities for teaching and research that are vital for any institution. Since 1986, till date this daunting task of developing the Veterinary and Animal Sciences College from its infancy has been phenomenal.

All the departments of the College are contributing their utmost efforts to create an impact on livestock development programmes in the state. The young highly qualified energetic and devoted faculty has been pivotal in the continuous growth of the College. Many of faculty members have won National and International recognition. Despite several impediments, the College continues to perform excellently.

First block of the main building of the College was ready for occupation in 1991. Other buildings of the College include Experimental animal sheds, Physiology Block, Veterinary Clinic, Radiology Block, Gynecology Block, Fishery Block, Disease research laboratory-cum-necropsy complex, and indoor clinic for each species of livestock, rest room for attendants of indoor patients.

The Veterinary Clinic is the hub of activity of the College. It provides a training platform for graduates and postgraduates and attracts referral cases from distant parts of the state. The College also holds regular clinical camps in different villages, even in remote mountainous parts of the state where experts from the College treat sick animals at the door-steps of the farmers. The Disease Investigation Laboratory of the College attends to field outbreaks of various diseases/conditions; it establishes the etiology of the disease as well as determines the kind of effective drug against infectious agents and suggests treatment/control measures. The College also renders consultancy services to the farmers for economical dairying, poultry, rabbitry and scientific feeding and management of various species of livestock.

The College is, comparatively young yet several need based and location specific research priorities have been identified by various departments. To name some of these are: very low milk production potential of local cattle, buffaloes and yaks, low and inferior quality of wool production in Gaddi sheep, acute shortage of nutritive fodders, poor quality grasses and quality feeds, lack of scientific know-how for the proper management of exotic and crossbred animals; prevalence of various infectious and non infectious diseases among different species of livestock especially those of yaks, Chiggu goat, Spiti horses and Angora rabbits, sterility and infertility problems in various species of livestock, physiological parameters of yaks and Gaddi goats; toxicological studies of certain poisonous plants, chronic bovine haematuria and *Lantana* toxicity, anatomy and histology of yaks, Spiti horses and Gaddi goats, sedative standardization in yaks and autogenous synovial transfusion in animals. A number of research projects have been sanctioned by various agencies of the state and Central Governments, ICAR, Department of Biotechnology and NATP etc. and are in operation in the College.

SCOPE:

The prime objective of the teaching curriculum is to train veterinary graduates for (a) providing clinical treatment to ailing livestock (b) prevention and control of infectious diseases (c) intensive extension activities concerning improved livestock production (d) specialized service in regard to breeding, feeding, management and disease control to progressive livestock farmers and organized sectors (e) Veterinary services like meat inspection, maintaining disease free animals for experimental purposes(f), public health and zoonosis (g) on the spot

diagnosis of various diseases. The graduates so trained; both in livestock health and production serve not only in veterinary hospitals but also look after the livestock extension activities, as well as also compete in the Veterinary and Remount Corps of Army, SSB, BSF, nationalized banks, medical and para-medical institutions, pharmaceuticals, livestock feed plants, livestock & poultry product industries besides establishing their own polyclinics. The number of candidates to be admitted each year to BVSc & AH programme is decided in consultation with the Directorate of Animal Husbandry, Himachal Pradesh. Five nominees of VCI are also admitted each year as per their directions.

So far, 298 students have acquired BVSc & AH degree and are serving in different parts of the Country. Besides, students have completed their Master's Programme and Doctoral programme from this College. They are duly absorbed in Government Institutions and Universities. During the period under report, the annual intake of the students in BVSc & A. H. is 36 including 5 VCI nominees, besides 5 self sponsored, one each in-service nominee each of HP State Animal Husbandry department and CSKHPKV.

The Disease Diagnostic Laboratory of the college has rendered yeoman's service to the livestock of the State by way of attending to the various disease outbreaks among various species of livestock, poultry, wild fauna etc. and by undertaking epidemiological surveys on the profile of different livestock diseases..

TEACHING PROGRMMES

The revised curriculum as per the VCI comprises of 187 credit hours both in theory and practical. The curriculum has been modified to make it more practical oriented, which is the prime motive of the Veterinary Education. Tutorial system is to help and guide the students to receive education for all round development of their personality. Educational tours are arranged according to the course requirements and an All India level tour (only once) to get them acquainted with various on going activities pertaining to the profession. Ten per cent students in each class are awarded College Merit Scholarship @ Rs.250/- each per month.

STAFF PATTERN

After re-organisation and establishment of 18 departments, the faculty of College has 12 Professors, 26 Associate Professors and 20 Assistant Professors.

Universities in developing countries particularly the faculties of agriculture and veterinary medicine are under increasing governmental pressure to make direct, visible, and relevant contributions to National Research and Development. The teaching, research, and extension services are expected to be in line with National strategies for meeting the challenges of food security, economic growth, and sustainable environmental management. To improve teaching activities, research performance and extension activities, existing faculty positions need to

be strengthened further with 9 Professors, 17 Associate Professors/Scientists, 28 Assistant Professors/ Assistant Scientists in very near future to comply with the norms of Veterinary Council of India.

LIBRARY CUM READING ROOM

The reading Room in the College of Veterinary & Animal Sciences was started in 1997 as a humble start with the donation of the books from the faculty members of the College and Veterinary professionals. Later on, some text books were purchased under Dr. G.C. Negi Memorial Fund. Now, it has acquired a special place in the College campus.

It has a sitting capacity of 15-20 readers with a provision of 25 lockers for students for safe custody of their belongings. The "mini-library" has around 700 text books of different disciplines of Veterinary and Animal Sciences in addition to 1250 periodicals. More structural additions are required to be made to the reading room in near future.

BUDGET FOR THE YEAR 2003-04

Name of scheme/Code	Budget (Rs)	Salary	T.A	Contingency	Total
SFS-001/37	20,31,000	-	-	20,31,000	20,31,000
VNP-001/37	1,24,90,807	1,20,45,807	18,000	4,27,000	1,24,90,807
FNP-002-46	29,75,000	20,06,000	3000	74,000	20,83,000
FNP-101-PART 2/RESEARCH SECHEME TRIBAL		70,000	10,000	1,12,000	1,92,000
FPN-001-46 TEACHING PROGRAMME		6,27,000	4000	69,000	7,00,000
VNP-001-42	25,32,000	24,24,000	1000	2000	24,27,000
VPL-01-42 (VETERINARY)		78000	2000	25000	1,05,000
VPL-004-45	91,49,000	63,87,000	2000	-	63,89,000
VNP-006-45		27,59,000	1000	-	27,60,000
VNP-001-39	23,23,000	22,94,000	2000	27000	23,23,000
VNP-01-44	17,20,302	16,44,898	-	-	16,44,898
VNP-06-44		75,404	-	-	75404
VNP-01-38	27,94,906	27,62,418	492	31996	27,94,906
VNP-1-40	28,48,000	17,50,000	5000	10000	17,65,000
VNP-8-40		8,86,000	15000	182000	10,83,000
VNP-001-41	28,34,322	28,08,322	1000	25000	28,34,322
VNP-012-41		-	-	9000	9000
VNP-001-43	25,30,000	13,62,000	2000	12000	13,76,000
VNP-04-43		8,57,000	1000	12000	8,70,000
VPI-001-43			2000	23000	25000
VPI-011-43				12000	12000
VPI-007-43		2,20,000	1000	26000	2,47,000
TOTAL	**4,42,37,337**	**4,10,56,849**	**70492**	**31,09,996**	**4,42,37,337**

Enrolment and turn out of the Graduate students from 1986 till 2004.

Year	Enrollment	Students Passed out
1986-87	27	-
1987-88	21	-
1988-89	24	-
1989-90	30	-
1990-91	35	22
1991-92	23	23
1992-93	28	20
1993-94	30	24
1994-95	33	24
1995-96	37	18
1996-97	30	28
1997-98	37	20
1998-99	46	12
1999-00	38	19
2000-01	48	22
2001-02	45	17
2002-03	37	30
2003-04	36	21

Enrolment and turn out of the Post-Graduate students

Year	Enrollment		Students Passed out	
	M.V.Sc	Ph. D	M.V.Sc	Ph.D
1986-87	2	2	-	-
1987-88	1	-	-	-
1988-89	1	1	2	-
1989-90	2	2	1	2
1990-91	3	1	1	-
1991-92	-	-	2	2
1992-93	12	1	-	1
1993-94	9	-	4	-
1994-95	9	-	4	-
1995-96	11	-	4	1
1996-97	12	-	6	1
1997-98	12	1	7	1
1998-99	15	2	10	-
1999-00	14	-	11	-
2000-01	16	-	3	-
2001-02	22	-	-	-
2002-03				
2003-04				

Budget Allocation of the College during the Last few Years

YEAR	**1996**	**1997**	**1998**
AMOUNT(CRORE)	2.32	2.62	3.75
YEAR	**1999**	**2000**	**2001**
AMOUNT(CRORE)	4.54	4.40	3.87
YEAR	**2002**	**2003**	
AMOUNT(CRORE)		4.42	

ACTIVITIES OF THE INDIVIDUAL DEPARTMENTS

DEPARTMENT OF ANIMAL BREEDING AND GENETICS

Teaching Activities

Two students completed their research work during the year under report.

Research Activities

Characterization and conservation of Chegu goats

1. Identification and demarcation of the breeding tract of Chegu breed of mountain goats along with ancillary information on topography, agro-climatic conditions, soil type, forage resources and farming systems of the natural habitat. The true breeding tract in H.P. is the cold desert region of Kinnaur and Spiti with pockets of distribution in high altitude areas of Lahaul and Pangi sub divisions of H.P. The villages with good elite animal population of the breed were identified.
2. Primary data on population status, distribution, breed utility, production system and socio- economic status of the goat breeders. The total population of typical Chegu goats true to the breed in the state is currently 6000-7000 which is stable. The villages with major population in the breeding tract as well as in the pockets of distribution have been identified for undertaking conservation efforts.
3. Development of breed descriptor for Chegu breed of Indian goats incorporating baseline data on utility, population status, production system in the native tract ,native environs, morphological and economic characteristics of the breed under field conditions in breeding tract.
4. Identification of the elite germ plasm in the breeding tract along with genetic variability for production attributes. The elite males (28 no.) were procured after selection for use in semen collection.
5. Molecular characterization of the breed using micro-satellite markers. The data is available on allelic frequency, PCR product size range, observed and effective number of alleles, observed and effective heterozygosity, and PIC in Chegu goats. The studies also showed higher relatedness of the Chegu breed with Tibetian goat breeds reflecting close relationship between the two breeds.
6. Primary data on semen characteristics, freezability and cryo-preservation of Chegu semen for future use. The semen attributes (Progressive motility, live /dead sperm count, acrosomal integrity and sperm abnormalities) has been evaluated. The freezability of Chegu buck semen in LN_2 has been studied for using the technology of AI in goats and for undertaking ex situ breed conservation.
7. Cryo-preservation of the germplasm for posterity. Till date approx. 2500 DFS straws from 15 elite bucks of Chegu breed has been cryo-preserved out of which 2300 straws from 12 bucks has already been deposited in National Animal Gene Bank at NBAGR, Karnal, the lead centre of the project. The work on collection and cryo-preservation of semen is still in progress and more straws from more elite bucks will soon be prepared and stored.
8. Social awareness among the breeders regarding utility of the breed and its conservation as a component of animal biodiversity is being created. The assistance of mass media/press is also being solicited in this campaign.

Genetic characterization & conservation of important sheep & goat breeds of arid zone

The significant achievements of the project are as follows:

1. Systematic survey has been completed for all the three districts viz. Kangra, Chamba and Kullu.

2.Data recorded on 3000 animals of Gaddi Sheep & Goat respectively.
3.The migratory routes and breeding tract of 214 flocks have been established.
4.Data on growth & morphological traits on various aspects like birth weight, body weight, body length, heart girth, body height etc. on animals at different ages have been recorded.

5.Recording of data on more number of animals is needed w.r.t milk yield, carcass characteristics, reproductive traits and information on physical characteristics like horn pattern, head profile, ear pattern and tail pattern is required.
6.Additional information on Desi goat existing in these three districts on all the characteristics under study has also been collected.
7.Data on weather performance, socio-economic parameters and on other aspects have been collected in all the three districts.

Network Project On Animal Genetic Resources Spiti Horse (In-Situ Conservation Unit)

1. Spiti (Chamurthi) is one of the six recognized breeds of Indian horses. This breed is distributed in Lahaul & Spiti and Kinnaur districts of Himachal Pradesh. Similar types of horses are also found in adjoining alpine regions of Ladhakh and Tibet. These horses are known for their stamina and sure footedness in the undulating hilly topography of the region and are utilized as multi purpose pack animal for transportation, riding, racing and other draught purposes. The main breeding tract of these horses is confined to the Pin Valley region of the Spiti sub-division.

2.During this year, 31 elite Spiti female horses from seven villages (Mud-6, Sagnum-9, Guiling-6, Selling-2, Upper Guiling-2, Bhar-5 and Kungri-1) were identified, selected and registered under the project. As per the provisions under the project, the owners of theses selected broodmares were given financial incentives to the tune of Rs. 3000 per owner on account of maintenance cost of the animal so that good and healthy progeny is born. Besides, the progress of the 29 broodmares which were registered last year was also undertaken and six male foals born out of these elite female animals were also selected under the project and first installment of Rs. 5000 was provided to the owners of these animals on account of partial maintenance cost.

Improvement Of Migratory Sheep Production Programme for the Tribal, Backward and Hilly Areas

1.Due to harsh climate condition and passing through difficult terrains during breeding season in the migratory flocks in Himachal Pradesh is restricted to 2 – 3 months to have Lambing only during downward migration to avoid high mortality.
2.Identified the causes of low productivity in the migratory flocks of Himachal Pradesh. Improper breeding practices inbreed migration stress, mineral cum vitamin deficiencies and insufficient Vety. aid and health coverage were identified as the factors responsible to lower the productivity of migratory flocks in H.P.
3.Breeding, Nutritional and Health interventions were decided to be provided to the migratory flocks to demonstrate the migratory sheep breeders to adopt these technologies for the improvement of their flocks.

4.Some migratory flocks were used as demonstrations units to demonstrate the effect of breeding nutritional and health technologies to other migratory sheep breeders in improving production and reproduction parameters and achieving higher returns from the migratory flocks.
5.Few breeding rams were selected from the breeders flock, purchased and distributed to the selected breeders to demonstrate optimum male and female ratio so that maximum number of ewes may carry lambs and breed any inbreeding going on in these migratory flocks.
6.Nutritional inputs in the form of mineral cum vitamin supplement was procured and distributed to the selected breeders to provide at least 8 – 12 grams of supplement per week per animal to minimize the mineral deficiencies and reduce migratory stress in these flocks.
7.Timely vaccination, regular drenching and six monthly dipping schedules were followed to avoid any outbreak of certain diseases and reduce the losses due to endo and ecto parasites.
8.Data on production and reproduction parameters were recorded on their animals to study the impact of these interventions on these traits.
9.Results obtained from the date recorded and analysed year wise shows noticeable improvement in all production and reproduction traits over years. This shows that there is a need of providing intervention of breeding, Nutritional and health to the migratory flocks which face a lot of loss in the production in the form of Live lambs born, growth rate and wool production parameters. Improvement in the means production figures reflects the impact of these interventions by taking care of the migration stress and insufficient feeding and health resources.
10.Group wise analysis of data shows impact of individual intervention on all the parameters studies. Better results observed in the animals of group- I show that the interventions provided to the animals have produced more improvement in all the parameters taken in the study as compared to other group of animals.
11.A clear cut effect of each intervention can be seen from the group wise analysis of the data showing the effect of every individual intervention of these Parameters. This helps the breeders to choose all or any of the combination of interventions as per his resources to get more returns from his flock.

Survey, evaluation , Characterization of Rampur Bushair sheep(Survey Unit)

The project started in April ,2004 so no significant achievement is there. The process of recruitment of staff is under way. The project is likely to cover the area of Kinnaur, Shimla and Bilaspur districts as significant of population of the breed reside there.

Future:

- Three district as above mentioned will be selected for the study. In each district 60 villages will be selected randomly spread over 12 strata's.
- The data on morphological traits on young, 6-12 months, adult rams and ewes will be recorded for characterization.
- The data on reproductive as well as on production traits will also be recorded.
- A minimum of 3000 animals will be selected for the study in next two years.

Survey and characterization of Spiti horses (concluded on 30.9.2003)

- The study was conducted in three districts (Lahaul Spiti, Kinnaur and Kangra) of the state under network project (ICAR).
- Demography status of the Spiti horse breed was established by systematic survey.
- Breed was characterized morphologically (Height, length, girth etc) along with other traits including reproduction.
- Different body colours of Spiti horses were studied.
- Breed descriptor of Spiti breed of horses was developed.

•Other profiles like hematological, biochemical, anatomical and disease were studied.

Publications

1.G.D. Vashista; **Sanjeet Katoch** and M.S. Pathania (2002) Impact of crossbreeding programme on cattle improvement in HP. Agr. Econ. Review **48-56**.

2.Agnihotri R.K.; **Katoch S**; Katoch R; Panda A.K. and Kaila O.P. (2003) Anthelmintic efficacy of albendendazole against natural strongyle infection of donkeys. Centaur XX-1:**15-17**.

3.Sanjeet Katoch; Dogra, P.K.; Thakur, Y.P. and Gupta, K (2004) Phenotypic characterization of Spiti horse in its breeding tract-body measurements Centaur XX-3 : **45-47**.

4.Kumar, R; **Sanjeet Katoch**; Gupta, K; Ajay Katoch; Dogra, P.K.; Sharma, K.B. (2004) Hematological profile of migratory Spiti Horses Centaur XX-3 : **54-56**.

5.Ajay Katoch; **Sanjeet Katoch**; Gupta, K; Dogra, P.K.; Sharma, S.K. and Thakur, Y.P. (2004) Mineral and Biochemical profiles in Spiti Horses Centaur XX-3 : **48-49**

DEPARTMENT OF ANIMAL NUTRITION

Teaching Activities

Besides UG courses 15 + 21 Cr. Hrs were offered to Post Graduate students of M.V.Sc programme. Two students competed their M.V.Sc and one student has completed his course work and initiated research work.

Research Activities

Post Graduate Research Programme

Evaluation of complete feed blocks for milk production in crossbred cattle

The improvement in the low nutritive value of pasture grass can be done by addition of concentrates. The density of pasture grass can be increased upto 6-7 times by compaction. Block making require less storage space and easy handling further less labour is required to handle many nos. of animals as compared to conventional type of feeding system.

1.Post compression expansion was higher immediately after formulation and later it was negligible.

2.The block with high concentrates may get infected with fungus at higher per cent of humidity .

3.Dry matter intake was higher in complete feeds than in conventional feeds .

4.Digestibility coefficients were also higher in complete feed block feeding .

5.DCP and TDN per cent as well as their intakes were also higher in complete feed block feeding system. Nitrogen intakes were also higher in complete feed block feeding system.

6.Complete block feeding have shown the drastic effects in increasing milk production.

7.Complete feed blocks may also increase the milk protein per cent .

Likely Impact

The development of methods for improving the nutritive value of poor quality feed resources (pasture grass hay) will help in efficient utilization of these in animal diets. The developmental technology of roughage based complete feed blocks will not only help in increasing productivity of animals but also help in minimizing migration in lean seasons, transportation and bleaching of nutrients under open storage system . The nutritionally economic , complete feed block will also be of great use especially under natural calamities.

NATP (ICAR) Project

Evaluation of locally available feed and fodder to improve quality and formulate complete economic rations with high roughage diets

The project "Evaluation of locally available feed and fodder to improve quality and formulate complete economic rations with high roughage diets" in PSR mode under the NATP was sanctioned vide letter F. No. NATP/AED(Arid)/PAL 028/99 dated 20.11.1999 with lead centre at CSWRI. Avikanagar and 5 (IARI, New Delhi; IGFRI, Jhansi; RAU (B), Bikaner, HPKV, Palampur, NRCC, Bikaner) co-operating centers. During the period under report, 6 experiments were conducted at HPKV, Palampur after the installation of complete feed block making machine.

From the differerent experiments it was concluded that the complete feed blocks prepared in the ratio of 80:20 pasture grass hay to concentrate mixture improved the nutrient utilization as well as 30 and 40 per cent increase in body weights of calves and sheep. The complete feed blocks prepared in the ratio of 70:30 pasture grass hay to concentrate mixture increased the milk production up to 47 per cent. 30 farmers were given complete feed blocks for evaluation with traditional system of feeding.

Evaluation and improving locally available feed resources and developing feeding systems for improved livestock production

After the installation of complete feed block making machine in the Deptt. of Animal Nutrition, the complete feed blocks from locally available roughages viz. wheat bhusa, local grasses blended with concentrate consisting of cereals, oil seed cakes, mineral mixture, molasses in two ratios 70:30 and 60:40 (roughages : concentrate) were formulated.

These were evaluated in the university level in growing calves and lactating animals. In case of growing calves complete feed block (70:30) gave significantly 22% higher body weight gains over control with a net profit of Rs 900/- during the 120 days of rearing of calves and other combination containing 60:40 roughages: concentrate gave 20% higher milk yield in cattles. .

The same combination were evaluated at field level in zone IV (Lahaul & Spiti, 10 families), zone I (Kangra, 10 families), and zone II (Bilaspur, 10 families) gave 63% higher milk production over the traditional method of feeding.

DBT Adhoc Project

Development of Poultry Farming as Self Sustaining Units for Promotion of Rural Women Entrepreneurship

Last training camp on poultry farming was organized under DBT 343/44 project at CSK HPKV, Palampur for remaining women farmers selected under the project. Thereafter, 16 broilers units were established at farmers door step in different subdivisions of Kangra district alongwith the supply of different inputs required for poultry rearing. All the managemental practices ser carried out by the group of framer. At some places broilers were given feed supplemented with probiotics, gave higher average body weight alongwith better FCR, low mortality and higher cost cost benefit ration as compared to control birds. The overall results revealed that an average, a profit of Rs. 6.95 to Rs. 41.06 per broiler per family was achieved. Feed back data is being collected from the selected farmers and is under progress

Herbal Adhoc Project

Efficacy of Herbal Biocholine in controlling fatty liver syndrome in commercial broilers on high metabolic energy diet

Biocholine is a herbal product and in order to evaluate its effect to prevent fatty liver syndrome (FLS), a study was conducted to ascertain the efficacy of biocholine and synthatic choline chloride in day old broiler upto 6-8 weeks of age,

maintained on high metabolic energy (ME) diets. There were six treatments viz. T1(Control), T2 (Control bird with standard ration and Biocholine @500g/ton of feed), T3(Choline chloride @ 1Kg/ton of feed), T4 (Control bird fed high ME diet), T5 (Control birds with high ME diet with Biocholine @750g/ton of feed) and T6 (control birds fed high ME diet with choline chloride @1.5Kg/ton of feed).

The results of the present study showed that out of six treatment groups, only group T_2 and T_6 showed the highest body weight gain i.e. 859.00 ±4.93 and 819±20.50 alongwith better feed conversion ratio i.e. 1.31±0.16 and 1.55±0.15 in comparison to control and other treatment groups during starter phase which may be attributed to the high energetic diets to check the fat infiltration in the. During finisher phase the treatment group T_2 (507.06 ±21.01), T_3 (504.66 19.57), T_4 (589.09 ±23.27) and T_5 (563.03 ±17.28) showed higher gain in weight with better FCR. The over all (1-6 weeks) performance of broiler chicks showed higher gain in weight in T2 (1342.84 ±7.36) followed by T5 (1335.81 ± 16.40) T4 (1261.52±11.46), T3 (1175.06±7.51) and T6 (1160.71±39.76) with almost the same trend of FCR in these groups. The gain in weight was significantly higher in T2 and T5 groups when compared to control group. The perusal of data showed that biocholine prevented the liver from FLS in the broilers fed on high ME diets. Dressing percentage was also found to be significantly higher in T2 (62.22±0.25) and T_5 (61.99±0.18), whereas examination of liver tissues in all the revealed mostly normal appearance. However, liver samples in group T4 revealed yellow discolouration with its enlargement indicating fatty infiltration. Mortality was nil in all the treatment groups except 1% in control group (T1) during starter phase.

Extension activities

The Revolving Fund Scheme was sanctioned to this department during the financial year 1994-95 with an initial outlay of Rs. 25000/.

Preparation of feed products for sale: During the year under report, the following feed products were prepared and sold:

Sr. No	Feed Product	Quantity			Receipts(Rs)
		Production	Sale	Balance	
1	Uro-Mol-Min bricks (2.5Kg. each) Nos.	5,242	4,641	601	1,62,435.00
2	Uro-Mol-Min bricks (1Kg. each) Nos.	48	48	Nil	672.00
3	Uro-Mol-Min bricks (3Kg. each) Nos.	3,560	3,381	179	1,42,002.00
4	Mineral mixture (kg.)	7,379.85	6,471.550	908.3	2,58,862.00
5	Milk ration (kg.)	19,050	15,620	3,430	1,32,770.00
6	Broiler feed (kg.)	6,000	6,000	Nil	60,000.00
7	Calf grower ration(kg)	1,950	1,950	Nil	15,600.00
8	Layer feed (kg.)	39,180	39,180	Nil	3,52,620.00
9	Rabbit feed (kg.)	75	75	Nil	562.50
10	Dog biscuits (pack of 0.5 kg)	136	126	10	5,670.00
11	Egg production (No.)	61,958	61,958	Nil	97,341.00
12	Broiler production (kg.)	32,841	32,841	Nil	1,826.60
13	Layer production (kg.)	270.850	270.850	Nil	8,370.00
14.	Feed Analysis (No.)	13	-	-	3,900.00
	Total				**12,43,110.50**

The seed money of Rs. 25,000.00 received during 1994-95 was refunded to the University on 26.6.1999.Money contributed to start New Revolving Fund Schemes in the College of Veterinary & Animal Sciences.

1.A sum of Rs. 25,000.00/- was contributed for starting newly sanctioned Revolving Fund Scheme "Revolving Fund Scheme for milk and meat products" in pursuance of Comptroller's letter No. 38679-86 dated 19.6.1999 being operated in the Livestock Products Technology Department of COVAS.

2.A sum of Rs. 15,000.00/- was contributed for starting newly sanctioned Revolving Fund Scheme "Preparation of practical manuals and scientific literature by Departments of COVAS" in pursuance to Comptroller's letter No. 15305-56 dated 29.2.2000 being operated in the office of the Dean, COVAS.

3.A sum of 50,000/- was contributed for starting newly sanctioned Revolving Fund Scheme "Revolving Fund Scheme for Clinical Services for Livestock owners" in pursuance to Comptroller's letter No. 37008-13 dated 5.5.2001, being operated in the office of the Dean, COVAS.

4.A sum of Rs. 25,000/- was contributed for starting newly sanctioned Revolving Fund Scheme "Preparation and Utilisation of Farm Yard Manure at Livestock Farm" in pursuance to Comptroller's letter No. 40847-53 dated 22.5.2001, being operated at Livestock Farm. Thus total Rs. 1,15,000/- was contributed to different department of the College of Veterinary & Animal Sciences to start 4 Revolving Fund Schemes.

5.Rs. 50,000 was contributed to the Comptroller for common facilities.

6.Rs. 43,012/- was spent for furniture and lab work; Rs. 9,450/- was spent for grinder; Rs. 4,91,230 was spent for rewiring in the Metabolic Stall on 19.7.2001, extension of metabolic shed on 30.8.2001, provision of Gate Lights in the Metabolic Stall on 26.9.2001 further extension of metabolic stall (metabolic cages) on 7.12.2001 and this expenditure comes to Rs. 5,43,692. Thus permanent infrastructure worth Rs. 5,43,692 lacs were created with this currency of this Revolving fund scheme sine 1994-95

7.Balance in the ledger of Revolving Fund Scheme upto 06.07.2004 is Rs **10,31,109.67/-**

Extension Lectures delivered

37 lectures on varied topics of Animal Nutrition were delivered during training programmes organized by the Directorate of Extension Education, CSK HPKV, Palampur, besides, the Department also organisd the exhibition of the department activities in the State Level Kisan Mela (November, 2003) and State level Holi Mela (3rd-7th March 2004).

Other Activities

XXII conference of Indian Poultry Science Association and National Symposium on "Strategies for promoting commercial poultry farming in Hill" was organised by the Department at CSK HPKV, Palampur w.e.f. 7-9th April 2004.

Workshop, Conference and technical meetings Attended by faculty members

Sr. No.	Workshop/Conference	Name of the teacher
1.	XXII conference of Indian Poultry Science Association and National Symposium organized by Department of Animal Nutrition, COVAS, CSK HPKV, Palampur on 7th-9th April, 2004.	Dr. K.S. Sharma Dr.. V.K. Sharma Dr. Desy Wadhwa Dr. Meena Kuamri
2.	Xth Annual Conference of Indian Association for the advancement of Veterinary Research (IAAVR) and national Symposium on "Challenges and strategies for sustainable Animal Production in Mountains" Indian Veterinary Congress- "4th" VETEX 2003 organised by COVAS from 14th-15th June, 2003.	Dr.. V.K. Sharma Dr. Desy Wadhwa

3.	3rd site committee meeting of NATP projects at CSK HPKV, Palampur from 12th-13th, June, 2003.	Dr. K.S. Sharma Dr.. V.K. Sharma
4.	"One day Interactive Meet" of NATP projects held at CSWRI, Avikanagar on 26th July 2003.	Dr.. V.K. Sharma
5.	Annual workshop of NATP project entitled "Evaluation of locally available feed and fodder to improve quality and formulate complete economic rations in the high roughage diets" held at Mandi (Himachal Pradesh) on 3rd-4th September, 2003.	Dr. K.S. Sharma Dr.. V.K. Sharma
6.	One day satellite seminar on Biochemical approaches for crop improvement-oppertunities and challenges organized by Indian Society of Agricultural Biochemists, Palampur chapter on 24th September, 2003.	Dr. K.S. Sharma Dr.. V.K. Sharma
7.	Training workshop on personality development and students counseling organized by CSK HPKV, Palamapur from 8th-15th October, 2003.	Dr.. V.K. Sharma
8.	XI Animal Nutrition conference organized by Animal Nutrition Society of India and ICAR at JNKVV, Jabalpur from 5th-7th January, 2004.	Dr. K.S. Sharma Dr.. V.K. Sharma Dr. Desy Wadhwa
9.	4th site committee meeting of NATP projects at CSK HPKV, Palampur from 25th-26th February, 2004.	Dr. K.S. Sharma Dr.. V.K. Sharma
10.	Empowerment of women training programme under NATP organized by from 10th-24th March, 2004.	Dr. Desy Wadhwa
11.	Natioanl seminar on "Economic feeding and rearing of buffaloes under different agro-climatic regions organized by IGFRII, Jhansi from 12th-13th March, 2004.	Dr.. V.K. Sharma

Paper presented in conferences/symposiums:

1. Shivani Katoch, K.S. Sharma, Desy Wadhwa, Meena Kumari and B.S. Katoch (2004). Biological performance of chicken broilers fed newly isolated probiotics under varying environmental conditions. XXII conference of Indian Poultry Science Association and National Symposium on " Strategies for promoting commercial poultry farming in Hill" held at CSK HPKV, Palampur w.e.f. 7-9th April 2004 Abst. No. NFT 1.49:53.
2. K.S. Sharma, Tamanna Gupta, V.K. Sharma, Desy Wadhwa and Meena Kumari (2004). Field evaluation of some probiotics on "Biological performance of broilers" XXII conference of Indian Poultry Science Association and National Symposium on " Strategies for promoting commercial poultry farming in Hill" held at CSK HPKV, Palampur w.e.f. 7-9th April 2004 Abst. No. NFT 1.67:63.
3. K.S. Sharma, V.K. Sharma, Desy Wadhwa and Meena Kumari (2004). Efficacy of herbal biocholine on the biological performance of broilers fed on high energy diets. XXII conference of Indian Poultry Science Association and National Symposium on " Strategies for promoting commercial poultry farming in Hill" held at CSK HPKV, Palampur w.e.f. 7-9th April 2004 Page 17.
4. Shivani Katoch, Mukul Kaistha, K.S. Sharma. Meena Kumari and B.S. Katoch (2004). Effect of directly fed microbial isolated and cultured from vegetable sources on the biological performance of laying pullets XXII conference of Indian Poultry Science Association and National Symposium on " Strategies for promoting commercial poultry farming in Hill" held at CSK HPKV, Palampur w.e.f. 7-9th April 2004 Abst. No. NFT 1.68:64.
5. B.S. Katoch, Madhur Gupta, Shivani Katoch, Meena Kumari and K.S. Sharma (2004). Effect of intermitten dietary supplementation of combination of different strain of lactobacilli, streptococci and yeast isolated from different sources vis-à-vis the combination of their standard counter parts on the growth performance of commercial layer chicken from 1-18 weeks of age XXII conference of Indian Poultry Science Association and National Symposium on " Strategies for promoting commercial poultry farming in Hill" held at CSK HPKV, Palampur w.e.f. 7-9th April 2004 Abst. No. NFT 1.65:62.

6.K.S. Sharma, Tamanna Gupta, Desy Wadhwa, V.K. Sharma and Meena Kumari (2004). Validation of some promising probiotics isolated from indigenous sources in commercial broilers XXII conference of Indian Poultry Science Association and National Symposium on " Strategies for promoting commercial poultry farming in Hill" held at CSK HPKV, Palampur w.e.f. 7-9th April 2004 Abst. No. NFT 1.67:63.

7.V.K. Sharma, K.K. Dogra and Desy Wadhwa (2003). Effect of feeding different herbages in crossbred cows on milk production and nutrients utilization.

8.K.S. Sharma (2003). "Evaluation and improving locally available feed resources and developing feeding systems for improved livestock production" 3rd site committee meeting of NATP Projects.

9.V.K. Sharma (2003). "Evaluation of locally available feed and fodder to improve quality and formulate complete economic rations with high roughage diets" 3rd site committee meeting of NATP Projects.

10.V.K. Sharma (2003). "Evaluation of locally available feed and fodder to improve quality and formulate complete economic rations with high roughage. One day interactive meeting held at CSWRI, Avikanagr (Raj):.

11.V.K. Sharma (2003). "Evaluation of locally available feed and fodder to improve quality and formulate complete economic rations with high roughage. Annual Workshop held at Manali

12.V.K. Sharma, J.S. Chauhan and K.S. Sharma (2003). Evaluation of feeding dry temperate pasture grass hay in crss-bred calves. Indian Society of Agricultural Biochemists, Palampur Chapter: 105.

13.V. K. Sharma, J.S. Chauhan and K.S. Sharma (2003). Evaluation of pasture grass hay of dry temperate zoned of Himachal Pradesh in crossbred claves. XI Animal Nutrition Conference held at J.N.K.V.V. Jabalpur (MP):6.

14.K.S. Sharma (2004). "Evaluation and improving locally available feed resources and developing feeding systems for improved livestock production". 4th site committee meeting of NATP projects.

15.V.K. Sharma (2004). "Evaluation of locally available feed and fodder to improve quality and formulate complete economic rations with high roughage diets". 4th site committee meeting of NATP projects.

16.V.K. Sharma and C.I. Marwaha 92004). Buffalo productivity and rearing practices prevalent in Himachal Pradesh. AHB Lead paper. Indian Society for Buffalo Development held at IGFRI, Jhansi: 109.

Research Publication/Popular articles:

Paper Published:

1.Sudesh Radotra and V.K. Sharma (2003). Effect of feeding oats, peas and sarson mixed fodder on growth and nutrient utilization in grass bred heifers. Himachal J. Agricultural Reseach. 29C (1&2):101-109.

2.S. Katoch, M. Kaistha, K.S. Sharma, Meena Kumari and B.S. Katoch (2003). Biological performace of chicken fed newly isolated probiotics. Indian Journal of Animal Science 73 (11) : 1271-1273.

3.J.S. Chauhan and V.K. Sharma (2003). Garmino me pashuon ka Ahar Parntiya Khetibari 1-2:23-24.

4.Wadhwa, D; Wadhwa, D.R. and Sharma, K.S. 2003. Nutritional status and mastitis in dairy cows. Mastitis PP 53-64.

5.Wadhwa, D and Wadhwa, D.R. 2003. Nutritional strategies, Rumen manipulations and checking healths disorders for buffaloe production. Intas Polivet 4:225-233.

6.Sudesh Radotra, B.S. Katoch and V.K. Sharma (2004). Digestibility of nutrients, balance of nitrogen and growth performance in diary heifers fed mixed forage diets. Indian J. Animal Science. 74(2):200-204.

7.V.K. Sharma and C.L. Marwaha (2004). Buffalo productivity and raring practices prevalent in Himachal Pradesh. A Lead Paper. Indian Society for Buffalo Development: 109.

8.Wadhwa, D; Wadhwa and Dogra K.K. 2003. Nutritional evaluation of green panic grass (Panicum maximum vac. Trichoglucne) SAARS Journal. In press.
9.S.K. Pathak, N.K. Tripathi, V.K. Sharma and K.B. Sharma (2004). Macro and Micro mineral stauts of feeds and fodders in Bilaspur Distt. Of Himachal Pradesh. J. Animal Nutrition and Feed technology. In Press.

Book/Manual written:

1."Manual of practical-II of Animal Nutrition Courses (ANN 221 & ANN 222)" By K.S. Sharma, V.K. Sharma, Desy Rani and. Meena Kumari.
2."Pahari Kshetra mei murgi palan ek vyavsay" By Drs. K.S. Sharma, V.K. Sharma, Desy Rani and Dr. Meena Kumari
3."Compedium of XXII conference of Indian poultry science association & national symposium on strategies for promoting commercial poultry farming in hills

Awards and Honour

1.Vice Chancellor's appreciation award for year 2003 for excellent performance in training (poultry farming).
2.The project entitled "Evaluation of locally available feed and fodder to improve quality and formulate complete economic rations with high roughage diets", adjudged very good performance rating by the Peer Review Committee Meeting in 2003 at CAZRI, Jodhpur.

DEPARTMENT OF VETERINARY PHYSIOLOGY

The Department of Veterinary Physiology bagged an All India Co-ordinated Research Project on "Improvement of feed resources and nutrient utilization for raising animal production" worth Rs. 63.00 lakhs. This project commenced w.e.f. 01.04.2004.

Department has established a laboratory with sophisticated equipment for haematological, blood biochemical analysis and mineral estimations. The ultra modern equipments are also used for undergraduate and postgraduate teaching. In the field of research Department has carried out pioneering work in field of mineral status assessment, adaptational studies on migratory sheep, besides working on establishing physiological and biochemical profile of hill livestock. Recently ICAR has awarded AICRP entitled "Improvement of feed resources and nutrient utilization in raising animal production". The project study involves indentifying production limiting mineral deficiencies in state.

Teaching Activities

Besides the under graduate courses 15 credit hours were offered to P.G. students. One student completed his M.V.Sc. programme and his research work was on "Studies on the effect of vitamin A and minerals supplementation in anoestrous cows". Another student was admitted to PG programme in the department during the year.

Research Activities

Postgraduate Research

Studies on the effect of Vitamin - A and mineral supplementation in anestrous cows

The present investigation was carried out to study the effect of vitamin A and mineral supplementation in anoestrous cows and to suggest suitable measures to improve the reproductive status of such cows since anoestrus has been reported as single most frequent reproductive disorder in cattle. Investigation revealed a significant ($p<0.05$) rise in Hb, PCV and TEC in treated animals of livestock farm and field. In addition, a significantly higher MCH concentration was also noticed. A significantly ($p<0.05$) higher blood glucose concentration was recorded in treated animals of field as compared to control animals. Significantly higher values of total plasma protein were recorded in

treated animals of both livestock farm and field as compared to the anoestrous control animals. A non-significant decline was recorded in plasma albumin. Low A/G ration so obtained in treated groups could be because of significant ($p<0.05$) increase in total plasma Na, K, Mg and Ca of field animals after supplementation with mineral mixture and vitamin A was recorded. A significant ($p<0.05$) increase in plasma iron concentration was found in field animals supplemented with mineral mixture as compared to their respective control group; where as no significant difference was recorded in copper and zinc amongst the treated and control groups. In livestock farm, 66.67% anoestrous cows came in heat after treatment with vitamin A injection alone, whereas in field only 33.33% anoestrous cows came in heat after mineral supplementation while 83.33% cows came in heat after treatment with a combination of vitamin A and mineral supplementation.

Department Research haematology of Spiti Poni

Study was conducted on hematological profile of two groups of Spiti horses located at two different altitudes, to see the effect of migration as well as variation in female and male Spiti horses. The average hemoglobin concentration in Spiti horses at high altitude was 14.00 ± 0.49 gm/dl as compared to 12.47 ± 0.60 gm/dl in Spiti horses migrated to mid hill regions. Over all there was increased erythrocytic activity in animals staying at high altitude. Hemoglobin, hematocrit and TEC was higher in females as compared to male Spiti horses.

PUBLICATIONS

1. R. Kumar, Rajvir Singh, S.P.S. Sangha, K.B. Sharma and S.P. Singh(2003) Plasma dehydrogenase activity in sheep migrating to alpine pastures of north west Himalayan region. SARAS J of Livestock and Poultry Production 19(102): 79-83.
2. R. Kumar, S. Katoch, K.Gupta, Ajay Katoch, P.K. Dogra and K.B. Sharma(2003) Hematological profile of migratory Spiti Horses Centur XX:54-56.
3. Shagun Agarwal, R.Kumar and K.B.Sharma(2003) changes in electrolyte concentration during different phases of gestation in crossbred ewes. SARAS J. Of Livestock & Polultry production 19(3&4):44-46.
4. R.Kumar, K.B. & S.P.Singh (2003) Blood biochemical profile of migratory sheep of north west Himalayan region. The Indian Journal of Small ruminants (submitted).
5. Shagun Agrawal, R.Kumar and K B. Sharma (2003) Haematologial profile during different phases of gestation in crossbred ewes of Himachal Pradesh. The Indian Journal of Small Rumminants (submitted)
6. Girish Sharma,K.B.Sharma and R.kumar (2004) Effect of Vitamin A and Minerals supplementation on Haematological Values of Anoestrous Cows. Submitted for presentation in XX Annual Convention & National symposium on Advanced reproductive technologies for management of fertility in Livestock, going to be held at Durg, w.e.f. Nov. 24-26th, 2004.
7. Girish Sharma, K.B.,Sharma and R.Kumar (2004) Plasma macro and Micro Mineral Profile of Anoestrous Cow treated with Vitamin A and Minerals supplementation submitted for presentation in XX Annual Convention & National symposium on Advanced reproductive technologies for management of fertility in Livestock, going to be held at Durg, w.e.f. Nov. 24-26th, 2004.
8. Shagun Agrawal,R.Kumar,and K.B.Sharma (2004) Chnages in trace element concentration during different stages of gestation in migratory crossbred ewes of Himachal Pradesh submitted for presentation in XX Annual Convention &

National symposium on Advanced reproductive technologies for management of fertility in Livestock, going to be held at Durg, w.e.f. Nov. 24-26th, 2004.

9. Shagun Agrawal, R.Kumar and K.B.sharma (2004) Metabolic profile of post parturient crossbred migratory ewes of north west himalayan region submitted for presentation in XX Annual Convention & National symposium on Advanced reproductive technologies for management of fertility in Livestock, going to be held at Durg, w.e.f. Nov. 24-26th, 2004.
10. R.L.Bhardwaj,R.Kumar,K.B.Sharma,Rajesh Rajput and Sonia Sharma (2004) Macro and micro mineral concentration in genital tissues of Gaddi Goat submitted for presentation in XX Annual Convention & National symposium on Advanced reproductive technologies for management of fertility in Livestock, going to be held at Durg, w.e.f. Nov. 24-26th, 2004.

Radio Talk : Dr. K.B.Sharma, Assoc. Prof. & Head "Ghumantu Bher Bakrion mein Khanij Tatbon ka mahatav"

DEPARTMENT OF VETERINARY MICROBIOLOGY

Teaching activities

Besides the regular B.V.Sc & AH courses, the Department offered 24 credit hour courses for PG students in addition to the PG research credit hours in spite of very poor staff strength

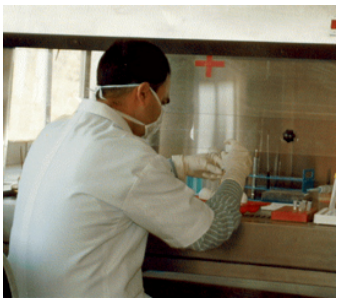
Research activities

Establishment of Disease Research Laboratory at HPKV, Palampur. This is a state funded research scheme operating in the department since 29-04-1988. The following research work was carried out in this scheme in the year under report. During the year starting from July, 2003 to June, 04, a total of 366 samples of animals were processed in the laboratory. This number does not include samples processed for specific diseases like brucellosis, Chlamydiosis etc

Livestock species-wise morbid materials processed for Microbiological investigations:

Months	Bovine	Buffaloes	Equine	Ovine/ Caprine	Canine	Poultry	Wild Bird	Total	Humans
July,03	16	2	2	1/-	7	5	-	33	31
Aug, 03	34	4	-	-/2	6	1	-	47	19
Sept,03	12	2	1	-/-	4	-	-	19	13
Oct, 03	15	-	1	-/-	5	11	-	32	8
Nov, 03	21	-	-	2/5	2	-	-	30	21
Dec, 03	19	-	2	2/6	-	-	-	29	12
Jan, 04	31	-	1	-/1	4	-	-	37	16
Feb, 04	13	1	-	4/7	1	1	-	27	13
Mar, 04	12	1	-	-/6	2	1	1	23	19
Apr, 04	18	5	1	-/-	2	5	-	31	8
May,04	23	-	-	11/1	4	5	-	44	19
June,04	12	-	1	-	1	-	-	14	13
Total	**226**	**15**	**9**	**20/28**	**38**	**29**	**1**	**366**	**192**

A total of 366 samples were processed from different species of animals. The samples comprised of milk, pus, faecal swabs, blood, cervical discharge, sputum, nasal swabs, vaginal swabs from aborted animals, ear swabs, prepucial swabs, skin scrapings, eye swabs, blood and urine etc.



Salient findings

a. *Proteus mirabilis* was isolated from tracheal and lung swabs of poultry. The bird was submitted by the Department of Veterinary Pathology.

b. *Salmonella gallinarum* was isolated from poultry liver. The sample was submitted by the Department of Veterinary Pathology.

c. *Candida spp*. was isolated from uterine discharge from a case of endometritis in bovine brought to the Veterinary Clinic.

d. *E. coli* was isolated from endocardial swab of Caprine. Sample was submitted by Department of Veterinary Pathology

e. Semen samples of six Jersey bulls and six Chigu goats from Dairy farm, CSK HPKVV, Palampur and Department of f.Animal Breeding and Genetics, respectively, were tested for microbial load.

f. Screening of samples for *Chlamydia*- Out of 306 samples of bovine serum submitted to this department from Anand, Gujarat and Andhra Pradesh, 23 samples were tested positive for Chlamydial antibodies by agar gel precipitation test.

g. Screening of samples for Brucellosis- out of 281 samples of bovine serum tested for *Brucella,* only two were found positive.

h. Samples of 11 eggs of poultry from Him hatcheries, Sundernagar were tested for bacterial infection.

i. Tuberculin testing was carried out in 171 dairy animals of Dairy Farm, CSK HPKVV, Palampur. Out of these, 33 animals were tested positive and 22 animals gave doubtful results.

j. Six samples from Operation Theater, Ayurvedic College, Paprola were tested for microbial load following 48 hours of fumigation. The table top swabs yielded *Nocardia spp*.

k. k. *Candida spp*. and *Shigella spp.* were isolated from human female and male urine samples respectively.

All India Network Programme on Haemorrhagic Septicaemia:

The All India Network Programme on Hemorrhagic Septicemia is an ICAR funded research project with net funds allocated as 11.10 lakhs. Under this project a total of 1141 samples have been processed to date. Out of 412 samples processed this year i.e. from July,2003 to June,2004, one isolate of *Pasteurella haemolytica* from the tracheal swab of goat and two isolates of *Pasteurella multocida* from goat and sheep lung tissue were obtained. The following numbers of samples were processed in the year July, 2003 to June, 2004 for the prevalence of *Pasteurella multocida*. The place of collection, species, kind of sample and number of samples collected is given in the following table:

An array of various samples collected and processed for isolation of *Pasteurella* spp. and other bacteria from different animal species

S. No.	Place of sample collection	Species	Kind of sample	No. of samples collected
1	Sheep breeding farm, Taal, Hamirpur	Sheep	Nasal swabs	70

2	Department of Animal Breeding and Genetics, CSKHPKVV, Palampur	Chigu goats	Nasal swabs	37
3	Rabbit farm, CSK HPKVV, Palampur	Rabbits	Nasal swabs	40
4	Rabbit farm, Kandbari	Rabbits	Nasal swabs	100
5	Slaughter house, Maranda, Kangra	Sheep	Tracheal swabs	4 3
		Goats	Lungs Tracheal swabs Lungs	17 22
6	Slaughter house, Paprola, Baijnath	Goats	Tracheal swabs Lungs	15 18
7	Department of Veterinary Pathology, CSKHPKVV, Palampur	Buffalo	Tracheal swabs	5 3
		Sheep	Lungs Lung Liver Kidney	1 1 1 1
		Goats	Spleen Tracheal swabs	1
8	Migratory flocks	Sheep	Nasal swabs	43
		Goats	Nasal swabs	30

Animal Health Information System through Disease Monitoring and surveillance (NATP):

The Project was started since 1-4-2000 for three years and nine months duration i.e., up to 26th December, 2003. The base line data up to Tehsil level has been collected. The collection of respective data related to the details of veterinary institutions, human population, households, animals etc. has been collected from various sources like Directorate of Animal Husbandry, Shimla, Directorate of Land Record, Shimla, Directorate of Economics and Statistics, Shimla for the smooth functioning of the project. The prospective data has been updated till 2003 and February, 2004 and transmitted. The monthly district level disease profiles of the livestock of Himachal Pradesh has been collected till February, 2004 and are being included in this report and being transmitted to the Lead Centre, Bangalore.

1. Livestock census of year 1997 which is the latest available have been mentioned district wise and included in the annual report. Human population of Himachal Pradesh obtained from census department of Shimla has been included. Human census of 2001 is also included tehsil and sub-tehsil.
2. Altogether in Himachal Pradesh 224 villages were surveyed from all 12 districts. So for the serum samples collection is concerned, 224 villages have been covered from all the 12 districts. One thousand six hundred and sixty four (1748) serum samples have been collected comprising of 1147 cattle, 226 buffaloes, 146 sheep and 229 goats.
3. The detail of the villages from where the serum samples have been collected with the other information as animal species, sex, age, date of collection, district and the administrative level etc.
4. Some of the villages are in the most difficult mountain terrain and some of the villages/D.P.F. selected by the lead centre particularly in district of Kinnaur having no livestock as well as human population, so the serum samples have

been collected from the adjoining villages whose animals grazes there in summer for a small period of time. However due to personal efforts from PI and Co PI.

5. The cattle and buffalo samples were further analyzed for *Brucella* antibodies by A-B ELISA at PD-ADMAS Hebbal, Bangalore, which indicated 3 cattle samples were positive for brucellosis out of 882 serum samples i.e. 0.34% and no buffalo sample was found positive for brucellosis.
6. Likewise no sheep sera was found positive for brucellosis out of 105 samples and one goat serum sample showed positive for *Brucella abortus* out of 199 serum samples i.e. 0.5% by Rose Bengal Plate Agglutination Test (RBPT).

Results of the serum samples tested for brucellosis Bovine sera:

In all 882 bovine serum samples were processed for detecting brucellosis that included 736 from cattle and 146 from buffaloes. Only three cattle samples were found to be positive for Brucella antibodies as below.

Sl. No.	ADMAS No.	CSKHPKV-No.	Antibodies to Brucella
1	HPC-950	CPKC-277	Positive
2	HPC-257	CBC-284	Positive
3	HPC-1179	MLC-507	Positive
4	HPC-777	CTC-104	Retest
5	HPC-778	CTC-105	Retest
6	HPC-951	CPKC-278	Retest
7	HPB-1540	KMB-130	Retest

Sheep & goat sera

In all, 105 sheep serum samples were found negative; where as one goat serum sample was found positive out of 199 serum samples for Brucella antibodies by Rose Bengal Plate Agglutination Test (RBPT).

Weather Based Animal Disease Forecasts (NATP):

Indian Agricultural Technology Project (NATP) Mission mode project on "Weather Based Animal Disease Forecasts" (WB_ADF) is conceived as an interactive, inter-institutional field based programme to develop weather based national disease forecasting system for enhancing livestock production through sustained reduction of animal diseases in different agro-eco zones. The project started from 26th August, 2000. In the beginning, the following prospective data was collected such as :

1. Baseline data;
2. District & Tehsil Index;
3. District, Tehsil & State profile
4. Livestock District Population profile
5. Livestock Monthly Disease profile
6. Meteorological profile

The collection of retrospective data from the state which were collected tehsil wise about following parameters was accomplished as:

1. Veterinary institutions-Indexing of the information about-In charge/ Place/Tehsil/District.
2. Collection of Veterinary research/clinical laboratories-Indexing of the information about in charge/ Place/Tehsil/District.
3. Collection of Livestock slaughter houses-Species slaughtered as well as indexing of the information about- Place/Tehsil/District
4. Collection of livestock migratory routes to different pastures grass lands, forests etc. in the Himachal Pradesh
5. Collection of livestock feed and fodder movements' routes in Himachal Pradesh

6.Collection of the details of livestock markets/fairs/melas held in the state in last five years period/place/type of market (weekly/fortnightly/monthly/annual)/ species involved/Average no of animals participated/ name of/names of the districts involved.

In addition to the information, other activities like information about agricultural activities of sub-tehsil and tehsil from respective sub-tehsil, tehsil and districts have also been collected.

Regularly updating of the above data by collecting the Livestock census of year 1992 (district wise and tehsil wise) and of 1997 has been collected district wise and transmitted. The monthly district level disease profiles of the livestock of Himachal Pradesh have been collected till February, 2004 and transmitted to the Lead Centre, Bangalore. Meteorological profile like Maximum/minimum temperature, Wind; speed, rainfall, Relative humidity, soil temperature of CSK HPKV, Palampur; Shimla; Sundernagar; Kalpa and Bhunter have been collected from CSK HPKV, Palampur and Meteorological Station, Delhi. Meteorological profile of CSK HPKV, Palampur has been updated till February, 2004. The assigned districts were regularly visited in the state viz. Chamba and Solan to obtain livestock disease outbreaks information. Human population 2001of Himachal Pradesh obtained from census department of Shimla has been collected. The data of various kinds collected right from 2001 was updated keeping in view the alterations in figures and transmitted to the Lead Centre, Bangalore. All the objectives assigned in this project have been achieved except the formulation and application of models that needs specific training by the Lead Centre to Co-operating Centre.

Post Graduate Research Work:

1. Name of the Student: Dr. Dushyant Gupta
Major advisor: Dr. Mandeep Sharma

BROAD OUTLINE OF THE PROPOSED WORK

Title of thesis :"Bacteriological studies on Pasteurellae associated with respiratory infections in livestock".

Objectives:

1.To isolate *Pasteurella spp.* from affected and susceptible livestock population.
2.Identification of *Pasteurella* spp. through cultural, morphological and biochemical features.
3.To correlate the clinical pasteurellosis with histopathological alteration and microbiological findings.
4.To screen samples of various secretions from clinically affected pasteurellosis cases through PCR.
5.To test *in vitro* the antimicrobial profile of isolate(s) by disc diffusion method in order to suggest a suitable line of treatment.

Brief outline of work:

Hemorrhagic septicemia in animals has been considered as the third largest killer and *P. multocida* induces different disease syndromes that pose a major health hazard for livestock in India. The organism explicit a wide antigenic multiplicity and it has not been possible to develop a foolproof vaccine for controlling this malady. Polymerase chain reaction (PCR) is a sensitive and promising diagnostic tool for confirming the presence of toxigenic *Pasteurella multocida* directly from nasal swab even without culture (Changsun *et al.* , 2001). This investigation envisages comparing the fidelity of PCR and conventional isolation for the diagnosis method of Paseturellosis in different species of livestock in Himachal Pradesh.

Establishment of small animal house:

The department is maintaining small laboratory animal house. Rabbits, guinea pigs, hamsters, mice, rats. sheep and poultry are being reared for doing experimental studies. If required, these animals are sold to other departments as well for the said purpose.

Extension activities

1. **Expert lectures delivered by the teachers of the department:**

During the period under report, a total of five expert lectures were delivered to approx. 300 registered dairy breeders of Solan district of H.P. The lectures concentrated on infectious diseases of live stock, their simple diagnosis, prevention and control measures.

2. **Disease outbreaks attended:**

No outbreak was reported to the department during the period under report. However, samples from two outbreaks were processed in the department.

3. Trainings attended:

Dr. Prasenjit Dhar, Asstt. Prof. attended an advanced training on the use of Map Info, KIMS and Arc view under the NATP project "Weather based animal disease forecasts" at PD_ADMAS, HEBBAL, Bangalore from 28-06-04 to 03-07-04.

Research articles published

1. Subhash Verma; R.C. Katoch.; Rajesh Chahota; Arvind Mahajan and Mandeep Sharma (2003). Drug resistance among pathogenic microbes: The new apocalypse. *Himachal Vet. J.* (5):10-15.
2. Mandeep Sharma; R.K. Asrani; R.C. Katoch; B. Pal; Subhash Verma; Vipasha Kapur and S. Mittra (2003). An outbreak of Haemorrhagic Septicaemia among cattle and buffaloes in Una district of Himachal Pradesh. *Himachal Vet. J.* (5):16-18.
3. D.R. Wadhwa; B. Prasad and Mandeep Sharma (2003). Mycotic mastitis in a cow and its management, A case report. *Himachal Vet. J.* (5):40-41.
4. Mandeep Sharma; R.C. Katoch; V.K. Gupta and M.K. Batta (2003). *Yersinia pseudotuberculosis* infection in lion *(Panthera leo*) cubs. *Ind. J. Anim. Sci*. 73, (2):163.
5. Subhash Verma; R.C. Katoch; Rajesh Chahota, Arvind Mahajan and Mandeep Sharma (2003). Bacterial strains isolated from eggs and their drug resistance profile. *Indian J. Poult. Sci.*, 38(1):80-82.
6. R.C. Katoch; Mandeep Sharma; D. Pathania; Subhash Verma; Rajesh Chahota and Arvind Mahajan (2003). Recovery of bacterial and mycotic fish pathogens from carps and other fish in Himachal Pradesh. *Indian Journal of Microbiology*, 43 (1), March 2003, 65-66.
7. Rajesh Chahota; Mandeep Sharma; R.C. Katoch; Subhash Verma; M.M. Singh; Vipasha Kapoor and R.K. Asrani (2003). Brucellosis outbreak in an organized dairy farm involving cows and in contact human beings in Himachal Pradesh, India. *VETERINARSKI ARHIV* 73(2), 95-102.
8. R.C. Katoch; Madhumeet Singh; Subhash Verma; V.K. Gupta; Mandeep Sharma and Vineeta Almadi (2004). Genital tuberculosis in a jersey crossbred cow. *Indian Vet. J.*, 81(2): 216-217.
9. R.C. Katoch; Subhash Verma; Arvind Mahajan; Mandeep Sharma; Rajesh Chahota and Vipin Katoch (2004). Necrotic enteritis in Chicken. *Indian Vet. J.*, 81(2):220-221.
10. Subhash Verma; R.C. Katoch; Mandeep Sharma; Rajesh Chahota and Pooja Soneja (2004). Sero-evidence of chlamydiosos among livestock. *Ind. J.Anim.Sci.*74(2):162:163.
11. Vinod Sharma, R.C. Katoch, Arvind Mahajan, Mandeep Sharma, Rajesh Chahota, Subhash Verma and Prasenjit Dhar (2004). Pathogenic potential of *Vibrio anguillarum* isolate in common carps. *Indian. Vet. J.* 81(6);616-619.

12. Prasenjit Dhar, R.C. Katoch, S.K. Jand and Rajiv Sharma (2004). Isolation and characterization of mycotic of flora associated with family *Cyprimidal* fish of Himachal Pradesh. *Ind. J. Anim. Sci*. 74 (2) : 235-237.
13. Subhash Verma; R.C. Katoch; Mandeep Sharma; Rajesh Chahota and Pooja Soneja.(2004).Sero-evidence of chlamydiosos among livestock. *Ind. J.Anim.Sci.*74(2):162:163.
14. Subhash Verma, R.C. Katoch and Prasenjit Dhar (2004). Pathogenic potential of *Vibrio anguillarum* isolate in common carps. *Indian. Vet. J.* 81(6);616-619.
15. Vipasha Kapoor, R. C. Katoch, Mandeep Sharma and Prasenjit Dhar. Mosaic of bacteria in respiratory diseases with special reference to Pasteurellae in gaddi sheep and goats in Himachal Pradesh. *Ind. J. Anim. Sci*.74(4):365-368, April 2004.
16. Vipasha Kapoor, R.C. Katoch, Mandeep Sharma, A.A. Kumar and Subhash Verma. Detection of *Pasteurella multocida* isolates by Polymerase Chain Reaction (PCR) and serotyping. *Ind. J. Anim. Sci*.74(7):724-725, July 2004.

Research articles accepted

1. R.C. Katoch, Mandeep Sharma, Arvind Mahajan, Prasenjit Dhar and Deepak Pathania. Mycopathogens of carps and other fish in Himachal Pradesh. *Ind. Vet. Journal.*
2. Subhash Verma, R.C. Katoch, Arvind Mahajan, Mandeep Sharma, Vipin Katoch, J.M. Kataria and K. Dhama. Confirmation of an outbreak of chicken infectious anemia in organized poultry farm by Polymerase Chain Reaction. *Indian. Vet. J.*
3. R.C. Katoch, R.S. Kisthwaria, Subhash Verma, Mandeep Sharma, V.K. Gupta and Rajinder Kumar. Confirmation of pulmonary tuberculosis on isolation and by PCR-RFLP in a crossbred cow. *Ind. Vet. J.*
4. Vipasha Kapoor, R.C. Katoch, Mandeep Sharma, A.A. Kumar and Subhash Verma. Confirmation of *Pasteurella multocida* isolates by Polymerase Chain Reaction (PCR) and serotyping. *Ind. J. Anim. Sci*.
5. Vipasha Kapoor, R. C. Katoch, Mandeep Sharma and Prasenjit Dhar. Mosaic of bacteria in respiratory diseases with special reference to Pasteurellae in gaddi sheep and goats in Himachal Pradesh. *Ind. J. Anim. Sci*.

DEPARTMENT OF VETERINARY PATHOLOGY

Teaching activities

There were 47 students in the 2nd Professional, 36 in the 3rd Professional and 21 + 42 students in the VLD classes during the year.One student completed M.V.Sc. in Veterinary Pathology during the period and two students were admitted.

Research activities

Live stock & Poultry Disease investigation as Departmental Project:

The project involves Disease diagnosis from necropsy in live stock & Poultry including wild life, biopsy & autopsy specimen examination besides attending to livestock disease out breaks and clinical pathological investigations.

Necropsy Investigation: A total of 831 necropsies conducted on livestock and poultry including wild life are listed below:

Month	Cattle	Rabbit	Poultry	Equine	Swine	Sheep & Goat	Buffalo	Wild life
July,2003	8	1	210	-	-	-	-	-
August	6	6	12	-	-	-	-	-
Sept.	4	2	10	-	-	-	-	-
Oct.	6	3	54	-	-	-	-	-

Nov.	2	-	24	-	-	1	-	-
Dec.	2	-	52	1	-	1	-	-
Jan.,2004	3	1	39	-	-	-	-	-
Feb.	3	-	14	-	1	1	-	-
Mar.	2	-	3	-	-	1	-	1
April	2	-	311	-	-	-	-	-
May	2	2	19	-	-	2	1	-
June	6	2	10	-	-	1	-	-
Total	46	17	757	1	1	7	1	1

Grand Total :831

In Cattle

The important conditions diagnosed were*, tub*erculosis, Babesiosis Hemorrhagic gastroenteritis, catarrhal enteritis, *E coli* infection omphalophlebitis, infectious pneumonia, hydropsy of body cavities, traumatic reticulopericarditis, anemia, hypostatic pneumonia, plant toxicicity-icterus, cerebral edema & hemorrhages. Acute arthritis, anthrax, abomasitis-ruminitis, rabies.

In equine: Hemolytic anemia.

In Wild life: Necrotic enteritis in Chakor.

In Sheep & goats

The condition diagnosed were: Vegetative endocarditis pneumonia and infectious pneumonia in goat and Verminous pneumonia with fasciolosis, infectious pneumonia with catarrhal enteritis and purulent meningitis in sheep.

In poultry:

Rickets, omphalitis, salmonellosis, fowl typhoid, Marek's disease, ascariasis, intestinal coccidiosis, caecal coccidiosis, Infectious buesal disease, *colibacillosis*, Marek's disease, , aspergillosis, Egg peritonitis & salpingitis, Hydropericardium syndrome, chronic respiratory disease.

In rabbits:

Catarrhal enteritis, Pneumonia & traumatic hind leg injuries.

Attending to Disease Outbreaks/ Morbid Materials:

Specialists of department made active contribution in attending to disease outbreaks in the state through participation in the Disease Investigation Team and/or providing histopathology support for final diagnosis on necropsy material & final diagnosis on biopsy material.

Histopathological investigations on necropsy material:

Fifteen necropsy samples were received in the department for histopathological investigations and their diagnosis conveyed.

Disease outbreaks investigated:

1. **In July, 2003,** a serious outbreak of Hydropericardium syndrome with over 60% mortality was recorded in a broiler flock (4 weeks) of the department of Animal Nutrition, CSK HPKV, Palampur. The feed samples were found to be free from mycotoxin contamination.
2. **In July, 2003,** an outbreak among migratory sheep and goats in Keylong, District Lahaul and Spiti was investigated to be caused by Pasteurellosis on the basis of clinical and histopathological studies. The flock responded to treatment with enrofloxacin.
3. **In November, 2003,** a rare outbreak of Hydropericardium syndrome with heavy mortality was recorded among commercial layers aged 45 weeks and 53 weeks at State Govt. Poultry Farm, Palampur.
4. **In Novemebr 2003,** an outbreak among cattle and buffalo at Kangra was investigated. The condition was diagnosed as late phase of FMD outbreak.
5. **In December, 2003,** an outbreak was reported among migratory sheep and goats at Kandar near Jukhala in the Bilaspur District of Himachal Pradesh. The

investigations on the basis of clinical examination suggested PPR as cause of outbreak associated with coccidial enteritis. The goats were also found positive for strongyle infestation.

6.In May, 2004, a disease outbreak among monkeys in Jakhu, Shimla, was investigated and diagnosed as acute bacterial gastroenteritis with toxaemia.

7. **Biopsy material for histopathological diagnosis:**

18 biopsies received in the department were examined and diagnosis conveyed.

Clinical samples analysed:

A number of clinical samples received from outbreaks, College Clinic, State Veterinary hospitals, animal farms etc. were analyzed for diagnostic support.

Research projects of Post Graduate program:

During the year under report Four MVSc students were working in the Department,one of them completed his program and one student completed research work while another two students are pursuing their course work.

Research projects in collaboration with other Departments of the College:

Dr V.K. Gupta, is Co-PI of NATP research project 'Studies on the efficacy of Seabuckthorn (Hippophae sp.) on soft tissue repair with particular reference to cutaneous wounds, burns and gastric ulcers'with Dr A.C. Varshney as the Project Incharge, in the Department of Veterinary Surgery & Radiology, COVAS, CSK HPKV Palampur.

EXTENSION ACTIVITIES:

1.Farmers visiting the Department for disease investigation and consultation were educated for preventions and control of diseases in livestock and poultry.
2.Farmers visiting the Silver Jubilee Celebration Vet-Fair and Kisan Melas were demonstrated the diseases of animals and advised about improved manage mental practices for prevention and control of diseases.
3.A number of lecture were delivered in specialized training programs, campus short duration farmers training courses organized by the Department of Veterinary pathology, COVAS and Directorate of Extension Education, CSK HPKV Palampur.

Short courses/ summer schools / trainings attended

1.Dr V.K. Gupta, Associate Professor, attended DBT-Sponsored Training Course on Molecular Biology & Biotechnology Techniques In Animal Research', at IVRI, Izatnagar from 30 August To 27th September 2003.
2.Dr V.K. Gupta & Dr R.K Asrani, Associate Professors, attended Training workshop on 'Personality Development and students counselling' from 8.10.2003 to 15.10.2003, held at CSK HPKV Palampur.
3.Dr V.K. Gupta, Associate Professor, attended ICAR –Sponsored Summer School on Recent Advances in Agricultural Research Project Management' at NAARM, Hydrabad from 27 May to 16 June 2004.

Conferences / Symposias/ Seminars and other meetings attended:

1.Dr V.K. Gupta & Dr R.K Asrani, attended National Symposium on 'Basic Pathology and Animal Diseases –A need for fresh approach in Indian Scenario' and XX Annual Conference of Indian Association of Veterinary Pathologists. Held at Jabalpur (MP) from 12-14 November 2003.

2.Dr V.K. Gupta, attended Seminar on 'Emerging Trends in Veterinary Practices-Regulations & Professional efficiency Development' held at Shimla on 20.2.2004 and made a presented on 'Role of Institution in efficient delivery of Veterinary Services' on behalf of the Dean, COVAS, CSK HPKV Palampur.
3.Dr R.K. Asrani, attended meeting of Regional Disease Diagnostic Laboratories held at New Delhi on 6.1.2004.

PUBLICATIONS

1. Mandeep Sharma; R.K Asrani; R.C. Katoch; B. Pal; Subhash Verma; Vipasha Kapur and S. Mittra (2003). An outbreak of Haemorrhagic Septicaemia among cattle and buffaloes in Una District of Himachal Pradesh. Himachal Vet. J. (5):16-18.
2. Rajesh Chahota; Mandeep Sharma; R.C. Katoch; Subhash Verma; M.M. Singh; Vipasha Kapur and R.K. Asrani (2003). Brucellosis outbreak in an organized dairy farm involving cows and in contact human beings in Himachal Pradesh, India.VETERINARSKI ARHIV 73 (2),95-102.
3. Vipasha Kapoor;R.C. Katoch; Mandeep Sharma and R.K. Asrani (2004). Pathogenicity test of Pasteurella multocida in mice A:1, Indian Journal of Animal Sciences 74 (5): 495-496.
4. Sharma Mandeep, Katoch, R.C., Gupta, V. K**.** & Batta, M.K. (2003). A report of two cases of *Yersinia pseudotuberculosis* infection in lion cubs (Panthers Leo). I. J. Anim. Sci. 73 (2):163.
5.Katoch, R.C., Singh Madhumeet, Verma Subhash, Gupta, V.K., Sharma Mandeep and Vineeta Almadi (2004). Genital tuberculosis in a jersey crossbred cow. Indian Vet. J. 81(2): 216-217.
6.Deshmukh Sidharth, Asrani R.K., Gupta, V.K. and Singh, S.P. (2004) Immunohistochemical demonstration of *S. gallinarum* in paraffin embedded tissue sections. A Poster Presented in the XX Annual Conference of Indian Association of Veterinary Pathologists. Held at Jabalpur (MP) from 12-14 November 2003. Bagged Savitree Jibachch Sinha best Poster Presentation Award.

DEPARTMENT OF VETERINARY PARASITOLOGY

Teaching activities

The courses were offered to the Under Graduate Students, as per V.C.I.(M.S.V.E., Degree Course Regulation ,1993), and courses were also offered to Postgraduate Students during the period of report.

Research activities

Investigation work is going on for the parasitological testing of water samples from different sources in and around Palampur. During the period of report 74 water samples from different sources were tested for the presence of parasitic stages. Out of which 7 samples were found positive for *Balantidium coli*.

Work Carried out in the project entitled "Efficacy of herbal antianemic(Ferrocom) against anaemia induced by Haemonchus contortus in sheep" funded by Indian Herbs,Saharanpur :

In this project 20 animals (sheep) have been purchased. Fresh *Haemonchus contortus* were procured from the local slaughter houses. These worms were processed in the laboratory. The eggs were cultured to harvest the larval stages. After treating all the animals, two animals were made as donor by feeding 1000 larvae. After patency of the infection, the faecal samples of these donor animals were collected to culture the larval stages in large quantity for feeding to experimental animals. All 18 animals individually have been fed with 1000 larval stages oh *Haemonchus contortus* for development of anemia. The infection has

become patent in all the animals.The work is in progress to study the effect of ferrocom in anemic animals.

Forecast &surveillance Lab. For parasitic diseases in H.P.

Samples screened from in and around Palampur:

107 samples suspected for different parasitic diseases were examined in the department of Parasitology during the year under report. These samples belonged to Palampur and to surrounding areas. The representative animal species were cattle, sheep, lion ,dog, monkey, goat, equine, buffalo , poultry and human beings. During the period overall parasitism in this area was found to be 50.46%.In cattle predominant parasites observed were amphistomes followed by strongyles and *Fasciola*.In case of equines strongylesw were found. The detail in respect of other animal species has been given in table - 4 .

Samples examined in and around Palampur for parasitic infections.

Animal species	No.of samples examined	Samples positive for parasites	Samples negative for parasites	F	A	S	C	Th	Dc	Mixed
Cattle	49	27	22	04	11	08	02	02	-	03
Sheep	05	05	00	01		03	01			
Lion	02	02	00			01	01			
Dog	04	01	03						01	
Human	14	00	14							
Monkey	06	00	06							
Goat	02	02	00			01		01		
Equine	12	09	03			09				
Buffalo	12	07	05			04	03			
Poultry	01	01	00				01			
Total	107	54 (50.46%)	53							

F =*Fasciola* ; A=Amphistomes ; S=Strongyles ; C= Coccidia ;As=Ascarids; Th =*Theileria, Dc=Dipylidium caninum*

Publications (Published and Accepted, 2003-2004):

1. Katoch, R, Das, K.S; Wadhwa, DR; Panda, A. K.and Agnihotri,RK (2004) Efficacy of doramectin against endo and ecto parasites in goats. J.Vet. Parasitol. Vol.18, pp 93-94.

2.Katoch, R., Bhardwaj, R.L., Rajput, R., Panda, A. K. and Sharma Alok (2004) Incidence of Bot in Equines of North Western Himalayas. *Centaur*. XX(4) :66-67.

3.Wadhwa, DR; Katoch, R; Prasad, B and Patial, VS (2003) An outbreak of fascioliasis in migratory sheep and goats. Himachal Vet. J. 5: 19-20.

4.Panda, A. K., Katoch, R and Sharma, Alok. K.(2003) Rabies: the Public Health Significance in Himachal Pradesh. APCRI-CON pp- 123-25

5.Sharma, Alok K., Panda, A. K., Khurana, S.K., Katoch, S. and Katoch, R. (2004) Prevalence of brucellosis in Spiti horses in North-Western Himalayas. *Centaur*. XX(4) : 63-65.

6.Katoch, R, Agnihotri,RK, Singh,M.M., Panda, A. K and Mittra, S (2004). Increasing incidence of hypodermosis in Kangra valley of Himachal Pradesh. (Accepted in J. Vet. Parasitol.)

7. Khurana,S.K. and Mittra,S.(2004) Salmonellosis in poultry and its public health significance. Alembic QSN, Vol-1, Issue-2 , April-June,2004.

Paper presented in Congress/Seminar /Conferences/Symp.

1. Panda, A. K., Katoch, R. and Kurade, N. P. (2004)Health Hazards due to Environmental degradation in North-Western Himalayas. 6th World Congress on Environment Management,11-13thJune 2004, Palampur.

2.Tyagi,S.P.and Mittra,S. A report on the Thelazia callipaeda infection in dog. 27th Annual Congress of ISVS,20-22 Nov,2003,Pantnagar.

Extension activities

Extension lectures :

Faculty members delivered 23 lectures on different topics in various training programmes organized by Directorate of Extension Education, Dean COVAS and Department of Animal Nutrition.

Clinical camps attended during the period

During the period Dr.R.Katoch attended two clinical camps. One at Khajiar and one at Dalhousie on 19th and 21st April, 2004 and gave spot diagnosis of parasitic diseases as well as encouraged the farmers for taking necessary steps to prevent the parasitic diseases in their animals.

Out breaks

During the period Dr.R.K.Agnihotri attended a outbreak to identify the cause of death and suggest the line of treatment in monkeys at Shimla.

Participation in training/ symposia/workshop/conference etc during the period of report.

1.Dr. S.Mittra and Dr.Rajesh Katoch attended training workshop on "Personality developmentand student counselling" fror October 08 – 15,2003 , organized by College of Agriculture , CSKHPKV,Palampur.

2.Dr.S.Mittra attended training programme on " Multimedia in teaching" organized by TANUVAS at centre of advanced studies in Clinical Medicine, Ethics and Jurisprudence,Madras Veterinary College Chennai from 21.02.2004 to 12.03.2004.

3.Dr.S.Mittra attended training in "organic farming and "vermicomposting" organized by Human Resource development Centre,CSKHPKV,Palampur w.e.f.19 -25 March,2004.

4.Dr.S.Mittra attended orientation workshop for CSKHPKV website on 7.11.2003.

DEPARTMENT OF VETERINARY PHARMOCOLGY AND TOXICOLOGY

Teaching activities:

The department offered 12 credit hours to the UG students and 14 credit hours were offered to the PG students.2 students completed their M.V.Sc in Pharmacology and Toxicology during the period under report.

Research Activities:

Identification and evaluation of medicinal plants for the control of parasitic diseases in livestock

***In vivo* trials**

Methanolic extracts of *Bauhinia variegata* (Kachnar) at 50 and 100 mg/kg *per os* were used for studying *in vivo* anthelmintic action on the basis of reduction of fecal egg count of *Haemonchus contortus*. The results of the study revealed that methanolic extracts caused an only moderate reduction in the egg count. An increase in the dose rate did not affect the anthelmintic activity.

***In vitro* trials**

Eight fractions (F1 - F8) were collected from the methanolic extract on column chromatography. The maximum yield was obtained for the fraction collected in 100% methanol followed by fraction collected in chloroform : methanol (95 : 5). F3 fraction of methanolic extract collected in chloroform : methanol (90 : 10) of *B. variegata* had pronounced larvicidal action against *H. contortus* larvae and produced 90.29% larvicidal action at 8 mg/kg and 86.84% larvicidal action 72 hrs post incubation. Maximum recovery on column chromatography of methanolic extract was obtained for F7 fraction (chloroform 50 : methanol 50).

Methanolic extract of *Tagetes patula* at 2 mg/ml inhibited 100% egg hatching of *H. contortus* eggs. However the effect on embryonation was only moderate. The crude methanolic extract of *T. patula* flowers had only mild larvicidal action at 48 hrs post incubation at 2.5 mg/ml concentration. However F1 fraction exhibited 88.56% larvicidal action (L3 stage) at 2.5 mg/ml. F4 fraction (chloroform 85 : methanol 10) also revealed larvicidal action upto 71.16% at 2.5 mg/ml at 72 hrs. F1 fraction of methanolic extract (100% chloroform) of flowers of *Tagetes patula* inhibited both egg embryonation (76.83±2.87%) and egg hatching (84.64±0.5%) at 4 mg/ml in *H. contortus*.

F5 fraction (chloroform 50 : methanol 50) of methanolic extract of flowers of *Tagetes patula* possessed high adulticide action against *H. contortus*. On rechromatography R4 fraction (obtained by solvent system chloroform 75 : methanol 25) possessed adulticide action. TLC profile using solvent system chloroform : methanol : ethyl acetate revealed the appearance of bioactive constituent with Rf value of 0.782

Methanolic extract of Mentha spicata was found to possess ovicidal action (75.46 ± 1.02 %) at 8 mg/ml at 72 hrs post incubation.

Biochemical and Pharmacological studies on antioxidative effects of indigenous medicinal plants

The selection of plants having folklore claims of possessing antioxidant activity has been done. Plant samples of *Bacopa moneirii* (whole plant), *Camelia sinensis* (leaves), *Centella asiatica* (whole plant), *Hippophaea rhamnoides* (leaves and berries), *Terminalia bellerica* (leaves and fruit), *Tinospora cordifolia* (stem), *Vitex negundo* (leaves) and *Withania somnifera* (leaves) have been collected from different localities. These samples were shade-dried and extraction was done in aqua-methanol and dichloromethane. The percent recovery of various aqua-methanol extract varied from 9.18 to 24.58 while that of dichloromethane extract varied from 1.29 to 13.07. The scavenging capacity (SC; %) of both extracts of leaves and berries of *Hippophaea rhamnoides* was assessed at 25, 50, 100, 200, 400 and 800 µg/ml by using DPPH method. The aqua methanol extract of leaves of *H. rhamnoides* showed the SC (%) of 7.43 ± 0.45, 48.47± 0.17, 87.48 ± 0.15, 94.78 ± 0.19 and 94.36 ± 0.30 at 25, 50, 100, 200 and 400 µg/ml, respectively. Thereafter no change in SC was observed with increasing concentration. The dichloromethane extract of leaves of *H. rhamnoides* showed the SC (%) of 5.38 ± 0.41, 8.27 ± 0.47, 20.14 ± 0.16, 37.97 ± 0.65, 66.03 ± 0.88 and 95.08 ± 0.86 at 25, 50, 100, 200, 400 and 800 µg/ml. The SC (%) of aqua-methanol extract of berries was found to be 13.21 ± 0.45, 18.75 ± 0.36, 39.58 ± 0.34, 66.39 ± 0.22, 91.79 ± 0.06 and 93.61 ± 0.03 at 25, 50, 100, 200, 400 and 800 µg/ml, respectively. The dichloromethane extract of berries did not show Sc (%) at the

concentrations investigated (0, 1.16 ± 0.39, 2.79 ± 0.32, 6.08 ± 0.38, 12.18 ± 0.65 and 25.60 ± 0.63 at 25, 50, 100, 200, 400 and 800 µg/ml, respectively).

During the preliminary studies, the scavenging capacity (%) of methanolic extracts of *Artemisia nilagirica*, *Bauhinia variegata*, *Cinnamomum camphora*, *Hippophae rhamnoides* (berries), *Hippophae rhamnoides* (leaves), *Tagetes patula* and *Vitex negundo* was found to be 49.88, 13.25, 53.01, 79.03, 36.62, 11.80 and 12.38, respectively.

PUBLICATIONS

Published

1.R.S.Telang, H.C.Tripathi, S.K.Mishra and V.Raviprakash (2003). Adenosine affects the calcium dynamics of rat portal vein. *Autonomic and Autacoid Pharmacology* (Blackwell) 23(3): 181-192

Accepted

2.R.S.Deshwal, C.Varshneya, R.S.Telang, B.Prasad and R.K.Mandial (2004). Pharmacotherapeutic management in Respiratory Distress Syndrome in equines of Himachal Pradesh. *The Indian Veterinary Journal*. (Accepted, In Press)

3.Anita Singh, C.Varshneya, R.K.Agnihotri and R.S.Telang (2004). Medicinal plants of Himalayan region: A potential source of anthelmintic for livestock (Review article). *Journal of Veterinary Pharmacology & Toxicology* (Accepted)

4.R.S.Telang, R.K.Mandial, V.K.Gupta and R.Chahota (2004). Arsenic Poisoning in Animals of Himachal Pradesh: A Record. *The Indian Veterinary Journal* (Accepted, In Press)

5.Anita Singh, C.Varshneya and R.S.Telang (2004). *In vitro* anthelmintic effect of *Curcuma longa*. *The Indian Veterinary Journal* (Accepted, In Press)

Conference paper(s):

6.Anita Singh, C.Varshneya and R.S.Telang (2003). Flower-heads of *Tagetes patula* – A potential herbal anthelmintic. Presented in Satellite Seminar on *Biochemical approaches for crop improvement – Opportunities and challenges* held at CSK~HPKV, Palampur, HP, Sept. 24, 2003, p 103.

Participation in Conferences / Workshops:

1.Dr. C.Varshneya attended the NATP review workshop of the project titled "Identification and evaluation of medicinal plants for the control of parasitic diseases in livestock" at Central Institute for Research on Goats (CIRG), Makhdoom on 17-12-2003
2.Dr. C.Varshneya attended the 4th site committee meeting of NATP at CSK HPKV, Palampur, w.e.f. February 24-25, 2004
3.Dr. C.Varshneya participated in the Workshop on Personality Development, held at CSK~HPKV, Palampur, w.e.f. Apr. 28- Mar. 3, 2003.
4.Dr. R.S.Telang participated in the Workshop on Personality Development, held at CSK~HPKV, Palampur, w.e.f. Oct. 8-15, 2003.
5.Dr. R.S.Telang participated in the Seminar on IPR awareness under the scheme for Intellectual Property Education and Public Outreach, held at CSK~HPKV, Palampur, on Mar. 26, 2004

Outbreaks attended:

Dr. R.S.Telang attended disease outbreaks as follows:
1.At Jakhu Temple, Shimla to diagnose the cause of death of monkeys.
2.At VPO Sansai to investigate the disease in buffaloes & performed toxicological analysis of the samples submitted from outbreaks to the department from time to time.

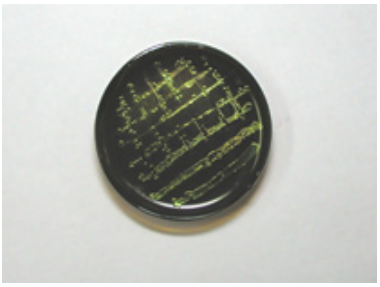
DEPARTMENT OF VETERINARY PUBLIC HEALTH

Teaching Activities

The two faculty members of the department were engaged in teaching of B.V.Sc & AH. Besides under graduate teaching, 9 credit hours were offered for Post graduate teaching.

Research Activities

Investigation work is going on for the bacteriological testing of water samples from different sources in and around Palampur. In all 74 water samples were analyzed, viz. tap(30), hand pump(19) and surface water(Khud/Kuhl/Bowri-16) and filter (UV-9). The coliform count more than acceptable limit was found in 15 samples of tap water(10 to > 2400), 16 samples of surface water(11 to > 2400) and 9 samples of hand pump water(10 to > 2400). *Escherichia coli* was absent in water samples of UV filter, 14 samples of hand pump and 17 samples of tap water. One sample of tap water and six sample of surface water revealed the presence of *Balantidium coli* trophozoites.



Neem oil, haldi, neem oil + haldi and neem oil + clove oil were evaluated against *Salmonella*, *Enterococcus*, *Staphylococcus*, *Listeria* and *Escherichia coli*. Neem oil was effective against Salmonella organisms with or without addition of haldi or clove oil. However it was moderately effective against *Enterococcus fecalis* with or without addition of haldi or clove oil. Against *Listeria monocytogenes*, neem oil, neem oil + haldi were ineffective but when neem oil was used in combination with clove oil it revealed increased sensitivity. Neem oil also showed moderate sensitivity against *Escherichia coli* and *Staphylococcus*. But its sensitivity increased when clove oil was added to neem oil.

Twenty nine air samples from different locations in and around Palampur were examined for its microbial quality during this period.

Eight blood samples from different animals were also tested for the presence of brucellosis by RBPT antigen.

Extension Activities

18 extension lectures were delivered during the year by the faculty members of the Department on various topics related to veterinary public health to the visiting farmers sponsored by various agencies like DRDA Solan, DRDA Mandi, SSB, Directorate of extension Education, CSKHPKV, Palampur

Publications

1. Panda, A. K., Katoch, R. and Kurade, N. P. (2004) Health Hazards due to Environmental degradation in North-Western Himalayas. 6th World Congress on Environment Management,11-13th June 2004, Palampur.
2. Sharma, Alok K., Panda, A. K., Khurana, S.K., Katoch, S. and Katoch, R. (2004) Prevalence of brucellosis in Spiti horses in North-Western Himalayas. Centaur. XX(4) : 63-65.
3. Katoch, R., Bhardwaj, R.L., Rajput, R., Panda, A. K. and Sharma Alok (2004) Incidence of Bot in Equines of North Western Himalayas. Centaur. XX(4) :66-67.
4. Panda, A. K., Katoch, R and Sharma, Alok. K.(2003) Rabies: the Public Health Significance in Himachal Pradesh. 5th National Conference on Rabies(APCRI-CON 2003) 4th -6th July,2003.
5. Sharma, Alok and Panda, A. K. (2003) i'kw ikydsk esM dkm ohekjh BSE Lks gwlhvkj jgsk . Dairy Darpan, 1(1): 31-32.

6. Khurana, S. K. and Mitra, S. (2004)Salmonellosis in poultry and its Public Health Significance QSN Vol. 1(2).
7.Katoch.R.,Khurana,S.K.;Chatterjee;S.;Telang,R.S.andAgnihotri,R.K.(2003).Ivermectin toxicity in fish : A controlled trial. J.Vet Parasitology.17(1): 79-80.

Abstracts

1. Panda, A.K., Khurana, S.K., Katoch, S., Katoch, R., and Sharma, A.K. (2003) Prevalence of brucellosis in Spiti horses in North-Western Himalayas Second Annual Conference Of Indian Association of Veterinary Public Health Specialists,20th -22nd Sept.,2003, Nagpur.
2. Panda, A.K., Bhardwaj, R.K, Katoch, R., Sharma, Alok K. and Rajput, R. (2003) In-vitro sensitivity of Neem oil, Haldi and Clove oil against Common pathogenic Microorganisms. Second Annual Conference of Indian Association of Veterinary Public Health Specialists,20th -22nd Sept., 2003, Nagpur.

Training/ Conference/Symposia attended

1. Sixth World Congress on Environment Management (WCEM-2004) Organized by World Environment Foundation on 11-13th June 2004, at Palampur-176 062 (HP), India. (By Dr. A. K. Panda)
2. XXII World's Poultry Congress and Exhibition Organized by World Poultry Science Association on 8-13 June 2004, at Istanbul, Turkey. (Dr. S.K. Khurana)
3. One day Seminar on IPR Awareness, March 26, 2004, Advanced Centre for Hill Bioresouces & Biotechnology, CSK, Himachal Pradesh Agriculture University, Palampur-176 062(By Dr. A. K. Panda)
4. Training course on Management of Microbes as an Instrument of SPS Compliance and International Livestock Trade. 16th November 2003 to 8thDecember, 2003. ICAR Centre of Advanced Studies. Department of Veterinary Microbiology, CCS, HAU, Hissar, Haryana. (By Dr. A. K. Panda)
5. Training Workshop on Personality Development and Student Counseling from October 8- 15, 2003, CSK-HPKV, Palampur 176062(HP) (Dr. S.K. Khurana)
6. 5th National Conference on Prevention and Control of Rabies in India (APCRI-CON 2003) 4th-6thJuly 2003. Organized by S.C.B Medical College, Cuttack, Organized at Hotel Swasti Plaza, Bhubaneswar, Orissa. (By Dr. A.K. Panda)

DEPARTMENT OF VETERINARY CLINICAL MEDICINE ETHICS AND JURISPRUDENCE

Teaching Activities

Besides Under graduate teaching, clinical/ambulatory/VLD/clinical camp courses, the faculty offered 22 credit hour courses to PG students.

Extension Activities

Diagnosis and treatment of clinical cases at college clinics

A total of 2327 clinical cases relating to Medicine discipline, in different species of animals were diagnosed and treated.

Examination of clinical samples

A total of 356 clinical samples (Faecal, blood, urine, milk and skin scrapings) obtained from sick animals were examined to provide confirmatory diagnosis.

Clinical Camps

Staff members of the department participated in 23 clinical/ animal health camps where clinical cases pertaining to medicine discipline were diagnosed and treated.

Disease outbreak and emergency services.

Department also provided services to attend disease outbreaks among the livestock, in addition to emergency and urgent services at the door step of the farmers of the state. A total of 3 disease outbreaks were attended where Pestes Des Petits Ruminant (PPR) and and bacterial gastro-enteritis were diagnosed and managed.

Extension lectures

A total of 36 extension lectures were delivered by the staff members of thedepartment to the farmers of the state during various short term extension trainings (dairy, poultry, rabbitory etc.) organised by the Directorate of Extension Education.

Radio talks:

Two radio talks were given at A.I.R. Dharamshala, on the topics as given below:

1. "Dairy pashuon mein doodh badhane ke kuchh nuskhe"(Some tips to increase the milk production in dairy animals) on 19-01-04.
2. "Gau pashuon mein khooni pishab"(Haemoglobinuria in dairy cattle) on 11-04-04.

Consultancy and Emergency services

These services were provided to the farmers either in the clinics or at the door step as & when required.

Services to livestock farm: Services were provided to CSK HPKV Livestock farm as & when required.

Research Activities

Efficacy of Babool (Acacia nilotica) and Jamun (Syzigium cuminii) bark extract on foot and mouth lesions due to Foot and Mouth Disease in animals.

Branches/twigs of Babool were collected and got identified botanically. Thereafter about 10 kg of bark was collected from the branches of the Babool tree from Akrot (Una) area of Himachal Pradesh. Similarly about 3 kg of bark was collected from Jamun tree from Palampur area. The barks from both the trees were cut into smaller pieces, shade dried and ground to fine powders for therapeutic use in clinical cases of foot and mouth disease in animals.

Clinical assessment of dehaydration in the dogs and its management

Dehydration is the most common problem encountered in canine practice, as such the present study was undertaken. The dogs of Palam Valley of Himachal Pradesh were assessed in respect to types and degrees of dehydration. The haematological, biochemical and acid-base alterations in various types of dehydration were observed. Based on the observations of 543 cases, the overall incidence of dehydration was 11.43 per cent. The incidence of dehydration showed declining pattern from January till August and thereafter, it increased. Young dogs and the males suffered the most. All three types of dehydration i.e. isotonic, hypotonic and hypertonic were associated with gastrointestinal disturbances. Both the respiration and cardiac rates were significantly increased. Biochemically, hypoglycaemia, hypochloremia, hyperkalemia and increased blood urea nitrogen were observed. Acidotic dogs showed significant decrease in venous blood pH, base excess, standard bicarbonate and total carbon dioxide concentrations wheras concenrrations of above were increased in alkalotic dogs. Both Ringers lactate and normal saline solutions were found effective in

rehydrating the dogs suffering from acidosis and alkalosis giving a cure rate of 86.00 per cent, respectively.

Clinico-biochemical and therapeutic studies on lantana toxicosis in cattle.

Lantana poisoning in ruminants is one of the important causes affecting livestock population and causing great economic losses. In the study, 30 clinical cases of lantana toxicity were undertaken. These cases were divided into early and late cases. The animals presented before 3rd day of lantana ingestion were considered as warly cases and those presented on 4th day onwards were classified as late cases. A group of healthy animals comprising 10 cattle served as control group. Clinical, haematological, biochemical and rumen liquor studies were undertaken in lantana poisoned and healthy animals. The major clinical manifestations recorded were dullness, anorexia, constipated faeces, decreased urination, fry muzzle and swilling of eyelids and base of ear pinna. Most of the affected animals showed jaundice and dehydration. The haematological examination revealed elevated hemoglobin, packed cell volume and total erythrocyte count due to haemoconcentration. Blood clotting time was markedly elevated in all the lantana affected animals. The erythrocytes of the affected group were found more fragile than the control group animals. Biochemically, significant increase in the levels of total bilirubin, blood urea nitrogen, aspartate aminotransferases, alanine aminotransferases, alkaline phosphatase and acid phosphatases were observed. The pH of rumen liquor was alkaline with ammonical odour, watery consistency and nil protozoal count. Significant increase in SAT and decrease in GFT and TVFA concentration were observed in lantana-affected animals. Following the combined therapy comprising activated charcoal, dextrose saline, liver extract, purgative and rumenotorics, 76.92 % (10 out of 13) of early presented cases were treated successfully. However in late cases, recovery was seen only in 11.76 % (2 out of 17) animals.

Papers published:

1. Wadhwa, D.R., Prasad, B., Sharma, A.K., Nagal, K.B. and Chahota, R. (2003). Occurrence of pneumo-enteritis outbreaks suggestive of Peste-des-Petitis Ruminants (PPR) among small ruminants in Himachal Pradesh. Intas-Polivet. **4(1):** 69-71.
2. Wadhwa, D.R., Prasad, B., Mandial, R.K. and Pal, B. (2003). Prevalence of helminthic infections in buffaloes in Kangra Valley of H.P. Intas-Polyvet. **4 (2)**: 263-265.
3. Wadhwa, D.R. and Prasad, B. (2003). Studies on mineral and electrolyte profile in downer syndrome in buffaloes. Intas- Polivet. **4 (2):** 213-216.
4. Wadhwa, D. and Wadhwa, D.R. (2003) Nutrional strategies, rumen manipulations and cheacking health disorders for buffalo production. Intas Polivet. **4 (2):** 225-233.
5. Wadhwa, D. R., Prasad, B. and Mandial, R.K. (2003) Peste-des Petits Ruminants (PPR) - an emerging disease of small ruminants- An update. Himachal Vet. J. **5:** 1-6.
6. Wadhwa, D.R., Katoch, R., Prasad, B. and Patial, Y.S. (2003). An outbreak of fasciolosis in migratory sheep and goat. Himachal Vet. J. **5:** 19-20.
7. Wadhwa, D.R., Prasad, B. and Mandeep Sharma (2003). Mycotic mastitis in a cow and its management. Himachal Vet. J. **5:** 40-41.
8. Shrma Mandeep, Asrani RK, Katoch RC, Pal B, Verma Subhash, Kapur Vipasha and Mittra SK(2003). An outbreak of haemorrhagic septicaemia among cattle and buffaloes in Una district of Himachal Pradesh. Himachal Veterinary Journal, 5: 16-18

Papers accepted:

1. Wadhwa, D. R. and Prasad, B. (2003). Clinico-therapeutic studies on downer syndrome in buffaloes. Indian Vet. J.

2. Katoch, R., Das, K.S., Wadhwa, D.R., Panda, A.K. and agnihotri, R.K. (2003).Efficacy of doramectin against endo and ectoparasites of goats. J. Vet. Parasitology.
3. Mandial R.K., Prasad B, Telang RS and Sharma TR (2003). Occurrence of chronic plumbism in cattle of Himachal Pradesh. Ind. J. Vet. Med.
4. Telang RS, Mandial RK, Gupta VK, Chahota R and Kapoor KK (2003). Arsenic poisoning in animals of Himachal Pradesh. Ind. Vet. J.
5. Deshwal RS, Varshneya C, Telang RS, Prasad B and Mandial RK(2003).Parmacotherapeutic management of respiratory distress syndrome in equines of Himachal Pradesh. Indian Vet. J.

Papers presented:

1. Prasad, B. 2004. Current approach in the management of milk fever in cattle-Paper presented in Workshop of Veterinary Officers, held at NDUAT, Faizabad on 21-22 April,2004.
2. Prasad, B. 2004. Management of downer cow syndrome in dairy cattle-Paper presented in Workshop of Veterinary Officers, held at NDUAT, Faizabad on 21-22 April,2004.
3. Sharma, A. and Wadhwa, D.R. (2004) Clinico-biochemical and therapeutic studies on canine enteritis. Paper presented at 22nd annual conference of Indian society for Veterinary Medicine held at IVRI, Izatnagar w.e.f. Feb 11-13, 2004
4. Pal B and Pachauri SP (2004). Efficacy of oral rehydration solutions for correction of acid-base status in neonatal diarrheic calves – A comparative study. Paper presented at XI Annual Conference of Indian Association for the advancement of Veterinary Research and Indian Veterinary Congress held at IVRI wef Feb. 27-28,2004.

Conference/Symposia/ Workshop/ Training attended:

1. Dr. B. Prasad attended workshop of Veterinary Officer held at NAUDT, Faizabad (UP) on 21&22,April-2004.
2. Dr. Des Raj attended ICAR summer school on Advanced Diagnostic Techniques and therapeutic approaches to Metabolic and Deficiency Diseases held at Division of Medicine IVRI, Izatnagar w.e.f. July 15 Aug.4, 2003.
3. Dr. Des Raj attended "Tarining workshop on Personality Development and Student Counseling" held at CSK HPKV, Palampur w.e.f. Oct. 8-15, 2003
4. Dr.R.K.Mandial attended "Tarining workshop on Personality Development and Student Counseling" held at CSK HPKV, Palampur w.e.f. Oct. 8-15, 2003.
5. Dr.R.K.Mandial attended a national training on " Multimedia in Teaching" at Madras Veterinary College, Chennai, wef 21-2-04-12-3-04.
6. Dr. Des Raj attended 22st annual conference of Indian Society for Vety. Medicine and National symposium on "Latest approaches and biotechnological tools for health management of farm and companion animals" held at IVRI, Izatnagar w.e.f. Feb 11-13, 2004
7. Dr. Des Raj attended Workshop on Extension Methodology for scientists of CSK HPKV, Palampur, organized by Extension Education Institute, CCS HAU, Nilokheri and held at CSK HPKV, Palampur w.e.f. June 3-10,2004.
8. Dr. B. Pal attended XI annual conference of Indian Association for the Advancement of Veterinary Research and Indian Veterinary Congress, held at IVRI, Izaatnagar, wef Feb.27-28,2004.

Other Major Activities:

1. Dr. B. Prasad joined as Dean, Postgraduate Studies, on April 1st, 2004 in addition to his duty of Head of department of Veterinary Clinical Medicine, Ethics & Jurisprudence.

DEPARTMENT OF VETERINARY SURGERY AND RADIOLOGY

Teaching Activities

Besides the under graduate courses in Surgery and Radiology, Ambulatory Clinics/ camp and internship programme courses were offered to PG students, 21 credit hours were offered to M.V.Sc & 9 credit hours to Ph.D scholars.

During the session under report 1 student was admitted to the M.V.Sc programme of the department and 3 students continued from the previous year.

Research Activities

Evaluation of atropine-diazepam-propofol for balanced anesthesia in neonatal calves.

The study was conducted on 10 clinically healthy neonate male calves aged 10 -15 days. All the animals were kept under identical managemental conditions and were fed on milk during the course of experimental work. These animals were divided into two groups (Group I and Group II) of five animals each. Five animals were subjected for sedative, analgo-clinical, haemato-biochemical studies (Group I). In Group II animals various cardiovascular and electroencephalographic studies were carried out. All the animals were administered atropine sulphate (0.04 mg/Kg, SC) followed by diazepam (0.3 mg/Kg, IV) and 10 min later by one per cent propofol (IV) "to effect". All the parameters under study were recorded, before administration of anaesthetic agents, 10 min after administration of atropine and diazepam and at different intervals up to 75 min following administration of propofol.

The onset time and down time recorded for diazepam were 12.0 ± 2 sec and 19.63 ± 1.63 sec respectively. The mean dose of propofol IV for induction was found to be 5.15 ± 0.04 mg/Kg. The duration of surgical anaesthesia with complete analgesia recorded after diazepam-propofol administration was 8.6 ± 1.5 min (range 5-13). The sedation remained for 30-60 min. Moderate to complete abolition of various reflexes such as swallowing, photopupillary, corneal and palpebral was observed. Complete relaxation of neck, tail, anal sphincter and jaws was observed at 5 min interval. Lacrimation and salivation were absent in all the animals. Neonatal calves took 52 ± 6.32 min for complete recovery from anaesthesia.

A transient post induction apnea (approximately 10 sec) was recorded in all the calves along with non-significant decrease in respiration rate, heart rate and rectal temperature. All the haematological and biochemical parameters remained within the normal range in present study. Non significant increase in plasma glucose, serum ALT and AST were recorded.

Blood pressure parameters remained within the normal range during the present study. No significant changes in time and voltage components were recorded throughout the duration of the study. EEG studies revealed LVHF waves changing to LVLF waves after administration of diazepam and burst suppressions were recorded at 1, 5 and 15 min post propofol administration indicating surgical anaesthesia.

Studies on the efficacy of seabuckthorn (*Hippophae sp.*) in the healing of the burn wounds in calves

The study was conducted on 9 male calves, 6-12 months old by creating six equidimentional (2cmx2cm) burn wounds at thoracolumbar region in each animal.

The animals were divided into 3 Groups of 3 animals each viz. Group I (liquid paraffin, negative control), Group II (5% povidone iodine ointment, positive control), Group III (SBT oil, test). The treatment was immediately after creation of burns and the efficacy of different treatments was monitored by clinical, haematological, histopathological and histochemical parameters at 0, 3, 7, 14, 21 and 28 days.

The rectal temperature, respiration rate and heart rate in the animals of all the groups remained with in the normal range and did not show any significant change during the entire course of study. Grossly the signs of acute inflammatory reactions in cutaneous wounds were less pronounced in seabuckthorn(Group-III) and 5% povidone iodine (Group-II) treated animals as compared to paraffin treated group (Group-I) and the signs in the later group remained up to 7th DPT whereas these subsided by day 3rd post treatment in seabuckthorn and 5% povidone iodine treated animals. There was no exudate from any of the wounds irrespective of any treatment throughout the period of study except on 3rd and 7th day post treatment in paraffin group. The granulation tissue response was better in seabuckthorn and 5% povidone iodine treated wounds as compared to paraffin group. Complete epithelialization and scar formation was observed in cutaneous wounds on 14th and 21st days post operative in the animals of seabuckthorn and 5% povidone iodine treated wounds respectively as against 28th day in paraffin group animals. No significant changes in the haematological parameters i.e. Hb, PCV, TLC, TEC and DLC were noticed in all the animals of group-I, II and III when compared to 0 day value and when compared with each other that is in between the groups, the values remained with in the normal range.

Histopathologically and histochemically SBT and 5% povidone iodine shows better wound healing response characterized by less inflammation, less exudation, earlier granulation tissue formation, Collagenogenesis and its reorganization and strong affinity for PAS staining.

Studies on the efficacy of seabuckthorn (H*ippophae sp.*) oil in the healing of aseptic incisional cutaneous wounds in calves

The study was conducted on 9 male calves, 10-12 months old by creating six 2 inch aseptic incisional cutaneous wounds at thoracolumbar region in each animal. The animals were divided into 3 Groups of 3 animals each viz. Group I (liquid paraffin, negative control), Group II (5% povidone iodine ointment, positive control), Group III (SBT oil, test). The treatment started immediately after creation of wounds and the efficacy of different treatments was monitored by clinical, haematological, histopathological and histochemical parameters at 0, 3, 7, 14, 21 and 28 days.

Following treatment the rectal temperature, respiration rate, heart rate, Hb, PCV, TLC, TEC and DLC in the animals of all the groups remained with in the normal physiological limit. In seabuckthorn and 5% povidone-iodine treated animals the signs of inflammation started subsiding by 3rd day but in paraffin treated animals they subsided by 10th day. There was no exudation in seabuckthorn group throughout the study period. In 5% Povidone-iodine treated animals, out of three animal's one animal showed exudation at 3rd day but paraffin treated animals showed exudation upto 7th day. The 5%povidone-iodine group gained tensile strength upto 10.92% where as it was 14.28% in Group III.

Histopathologically, the signs of inflammation were comparatively less in group III when compared to group I. At 7th day in group III there was substantial increase in ground substance in deeper parts of wound when compared to group I and II. At day 10 group III showed the granulation tissue of relatively mature fibers. Collagen fibers were in abundance at the base of the wound but in superficial portion the granulation tissue showed fibroblasts along with mononuclear cells. In later stages on comparison to other groups it was noticed that collagen fibers appeared earlier and arranged parallel to skin surface. The fibrous tissue was more organized in group III. The infiltration was much less in

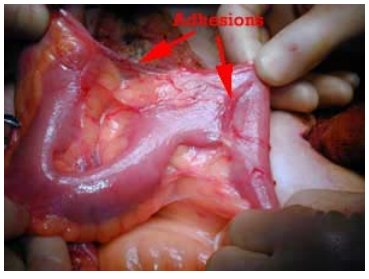
comparison to paraffin and 5% Povidone-iodine group. It was concluded that seabuckthorn oil treated wounds healed earlier than group I and II.

Studies for the evaluation of sub acute anti-inflammatory activity of seabuckthorn (*hippophae sp.)* Oil

The study was conducted in 12 dogs of either sex randomly divided into four groups (Group I, II, III and IV) of three animals each. In this study 4 sterile cotton pellets each weighing 100±5mg were inserted aseptically under general anaesthesia subcutaneously in the dorsum of the thoracolumbar region of all the animals at four different places to produce subacute inflammation. The site was covered with sterile gauze fixed with adhesive tape followed by a second layer of clean cloth. The dressings were changed once daily till 10th day and on alternate days thereafter. The animals of group I and group II were then fed seabuckthorn oil orally @ 0.5ml/kg and 1ml/kg body weight respectively once daily. In group III seabuckthorn oil was applied topically over the cotton pellet insertion site whereas group IV was kept as untreated control. Treatment was continued for 21 days in all the groups. The development of subacute inflammation and its progression were monitored by routine clinical examinations e.g. Rectal temperature, respiration rate, heart rate were recorded in all the animals at 3rd, 7th, 14th, 21st day after start of treatment and the weight of cotton granuloma at different intervals. Statistical analysis of the data was carried out using analysis of variance (ANOVA) and comparison between the treatments and days was done at 5 % level of significance.

Rectal temperature, respiration rate, heart rate did not show any significant change at different time intervals. Purulent exudate was observed in almost all the pellet insertion sites from 7-9 days onwards in all the groups which however subsided after removal of cotton pellets at different time intervals. The gross clinical symptoms of inflammation such as redness, localized irritation and warmth were comparable in all the groups throughout the study. The cotton pellets along with granuloma formed around them were removed aseptically under anaesthesia one at a time on day 3, 7, 15 and 21 of study. The pellets obtained were dried in oven overnight and their weight recorded. The weight of granuloma was ascertained by subtracting the weight of cotton pellet (100 mg) from it (Table 2). On different time interval the weight did not show any significant difference between the groups. It is thus concluded that the anti-inflammatory effect of seabuckthorn is too mild to be detected on sub acute inflammation in dogs. Improved curative effects of SBT oil were observed in acute radio-dermatitis (Zhang-Wenlu *et al.*, 1988) whereas it was able to inhibit artificially induced inflammation of mouse subcutaneous tissue (Lebedeva *et al.,* 1989). In an in vitro study Geetha *et al.* (2001) observed that SBT has antioxidant and immunomodulatory properties.

Surgical management of explosion injuries of face and oral cavity in dogs.



The pattern of trauma in animals due to explosion is always unpredictable and its management is often tedious. The present communication describes unusual cases of explosive injuries in dogs and their management.

Two adult male Gaddi dogs were presented to the clinics with the history of sustaining multiple injuries in a blast after accidental chewing of explosive devices one day back. Both the animals were dull, depressed and not eating, drinking and barking since then. Clinical examination revealed multiple injuries and burns of face and oral cavity of both animals. One animal had moderate avulsion of lower lip from its rostral surface, full thickness

fissure at philtrum and moderate trauma and burns inside oral cavity. The other animal was more serious and had extensive avulsion of both lips on either side with moderate loss of cheek tissue on right side, a maxillary fracture on right side extending up to nasal cavity and extensive burns and wounds in oral cavity. The wounds were lavaged with Ringer's lactate and dressed with 5% Povidone-Iodine ointment. Animals were stabilized by appropriate fluid therapy, analgesics, antibiotics and oral protectants for three days. Then reconstructive surgery were performed under general anaesthesia on both animals that included debridement of necrosed tissue, covering of cheek defect by pedicle graft, repair of lip avulsion by placement of transosseous sutures, repair of maxillary fracture by orthopaedic wiring and repair of philtrum fissure by two layers of sutures. A course of antibiotics, analgesics, fluid therapy, antiseptic dressing of wound and boroglycerine application in oral cavity was used postoperatively for variable periods. One animal made an uneventful recovery within 10 days whereas another one developed the complication of maggot infestations and subsequent extensive wound dehiscence; later it did not respond favourably to treatment and was euthanized after 28 days.

Conferences / trainings etc.

1. Dr. SK Sharma, and Dr. SP Tyagi, faculty members of the department attended the 27th National Conference, Indian Society for Veterinary Surgery, w.e.f. Nov. 20-22, 2003, Pantnagar.
2. Dr. A.C. Varshney and Dr. M.S. Kanwar attended Asian congress of zoo and wild life veterinarians. Feb 4-5th. Lucknow. U. P.
3. Dr. A.C. Varshney, Dr. S.K. Sharma and Dr. Adarsh Kumar attended H. P. State Vet. Council Seminar. Feb., 20, 2004, Shimla.

Research and clinical papers:

1. Tyagi, S.P., Kumar, A., Sharma, S.K., Varshney, A.C., and Singh, M. 2003. Translocation of tibial tuberosity along with trochlear recession and lateral capsular imbrication for correction of medial patellar luxation in dog. *Ind. Jr. Vet Surg.* 24(1): 54-55.
2. Singh, M., Sharma, A, Varshney, A.C., Sharma, S.K., Kumar, A. and Tyagi, S.P. 2003. Clinical management of retention of urine in bullocks-Review of 3 cases. *Himachal Vet. J.* 5: 36-38.
3. Singh, M., Sharma, S.K., Varshney, A.C., Kumar, A. and Tyagi, S.P. 2003. Surgical management of ventral hernia in sheep: review of 10 clinical cases. Himachal Vet. J. 5:24-25.
4. Tyagi, S.P., Kumar, A. and Varshney, A.C. 2002. Management of an unusual case of a foreign body in the tongue of a dog. *Ind. Vet. J.* (Submitted)
5. Tyagi, S.P., Kumar, A., Varshney, A.C. and Sharma, S.K. 2003. Correction of os-penis angulation by wedge osteotomy in a dog. *Ind. J. Vet. Surg.* 24(1): 64.
6. Kumar, A., Singh, M., Sharma, S.K., Tyagi, S.P. and Varshney, A.C. 2003. Surgical management of prepucial prolapse in a breeding bull: A case report. *Ind. Vet. J.* (Submitted)
7. Kumar, A., Singh, M., Sharma, S.K., Tyagi, S.P. and Varshney, A.C. 2003. Surgical management of Sarcoid in the nasal diverticulum of equine a case report. *Centaur* 21(4) 69-71.
8. Kumar, A., Mahajan, A., Mahajan, S., Gupta, A. and Sumra, H.S. 2003. Surgical management of skull trauma in a canine. *Himachal Vet. J.* 5: 32-33.
9. Gupta, A.K., Varshney, A.C., Singh, M. and Sharma, S.K. 2004. Synovial fluid alterations following homologous synovia transfusion in acute aseptic arthritis in equines. Indian J. Anim. Sci. 74: 51-53.

10. Gupta, S., Varshney, A.C., Singh, M. and Sharma, S.K. 2004. Synovial fluid as an aid in evaluating traumatic arthritis following intraarticular administration of fresh and preserved synovial in bovines. Indian Vet. J. 81:650-653.

Papers presented in the conferences:

- International Conferences

1. Varshney, A.C., Kumar, A., Tyagi, S.P., and Singh, V. 2003.Therapeutic evaluation of seabuckthorn oil in cutaneous burn wound healing in bovine: A clinico-haematological study. 1st Congress of the International Seabuckthorn Association, 14-19 Sept, Berlin, Germany.
2. S.K. Sharma, AC Varshney and Adarsh Kumar. 2003. Evaluation of Diazepam, Triflupromazine or medetomidine as sedatives for neonatal calves. 8th World congress of veterinary anesthesia held at Knoxville, University of Tennessee, USA w.e.f. Sept. 16-20, 2003
3. S.K. Sharma, AC Varshney and Adarsh Kumar. 2003. Evaluation of Xylazine-Detomidine or medetomidine with ketamine for surgical anesthesia in neonatal calves. 8th World congress of veterinary anesthesia held at Knoxville, University of Tennessee, USA w.e.f. Sept. 16-20, 2003
4. M.S. Kanwar, A. Kumar, S.K. Sharma, A.C. Varshney. Clinical evaluation of atropine-xylazine-ketamine as balanced anesthesia in dog. 8th World congress of veterinary anesthesia held at Knoxville, University of Tennessee, USA w.e.f. Sept. 16-20, 2003

- National Conferences

1. KP Singh, SK Sharma and A. Kumar. (2003). Atropine-diazepam-propofol as an induction anaesthetic combination for neonate calves: clinico-sedative, cardiovascular and electroencephalographic studies. 27th Annual Congress of Indian Society for Veterinary Surgery. 20-22 Nov. Pantnagar (Uttranchal).
2. Kumar, A., Varshney, A.C., Tyagi S.P. and Sharma D.N. 2003. Treatment of cutaneous burns with seabuckthorn oil in bovines: A histological study. 27th Annual Congress of Indian Society for Veterinary Surgery and National symposium. GBPUA & T, Pantnagar 20-22 Nov. Uttaranchal. India
3. Tyagi, S.P., Kumar A. and Varshney A.C. 2003. Surgical management of explosion injuries of face and oral cavity in dogs. 27th Annual Congress of Indian Society for Veterinary Surgery and National symposium. GBPUA & T, Pantnagar 20-22 Nov. Uttaranchal. India
4. Tyagi, S.P., Kumar, A., Varshney A.C. and Sharma, S.K. 2003. Surgical management of cataract in dogs: A clinical study. 27th Annual Congress of Indian Society for Veterinary Surgery and National symposium. GBPUA & T, Pantnagar 20-22 Nov. Uttaranchal. India
5. Singh, M., Singh, M.M., Kishtwaria, R.S. and Varshney A.C. 2004. Some clinical observations on chemical immobilization in leopards. Asian congress of zoo and wild life veterinarians. Feb 4-5th. Lucknow. U. P.
6. Varshney A.C. and Tyagi S.P. 2004. Studies on anti-inflammatory activities of seabuckthorn (Hippophae sp.) in canine. Asian congress of zoo and wild life veterinarians. Feb 4-5th. Lucknow. U. P.
7. Singh, M., Kishtwaria, R.S. and Varshney A.C. 2004. Progressive hind quarter paresis in lion cubs: A report of two cases. Asian congress of zoo and wild life veterinarians. Feb 4-5th. Lucknow. U. P.
8. Varshney A.C. 2004.Therapeutic potential of Seabuckthorn (*Hippophae* sp.) on soft tissue repair with particular reference to cutaneous wounds, burns and gastric ulcers in animals. Seminar on Seabuckthorn – A resource for environment, health and economy. Directorate of Life Sciences, D. R. D. O., March, 12-13, 2004, New Delhi. In compendium pp 26-28.

9. Varshney A.C. 2004.High altitude surgery in livestock (expert lecture). H. P. State Vet. Council Seminar. Feb., 20, 2004, Shimla.

Manuals and books:

1.MS Kanwar AC Varshney, SK Sharma, A. Kumar and SP Tyagi. (2002). Practical manual-Radiology, Regional and Clinical Surgery-II.

Training courses and other activities

1.Dr. M.S. Kanwar participated in workshop on " Computer aided learning, Human – Patient simulation" with special reference to animal model creation produced by University of Florida in 8th WCVA, USA.

2.Dr.M.S. Kanwar acted as Moderator of evaluation mission of Indo German Changer Eco development programme at Palampur and was invited to participate in interaction with German team on "Impact of Animal Husbandry on Socioeconomic aspects of farmers of H.P. on 21/04/04.

Extension activities

The department of surgery and Radiology actively renders the extension activities through college veterinary clinics, which is a nodal referral service window to the livestock owners and farmers. This is the only facility available of its type in whole Himachal Pradesh. The teachers of the department of Surgery and Radiology besides other clinical departments man the working of clinics. The faculty members attend the patients promptly round the clock including Sundays and holidays without any charges. The department also actively participates in organization of clinical camps in different adjoining as well as remote places of Himachal Pradesh.

1. **Veterinary clinic:** The department remained actively engaged in the college veterinary clinics for the treatment of sick animals requiring surgical intervention. In all 1338 cases related to surgery discipline were attended out of total 3827 cases presented to the veterinary clinics in the year 2003-2004. Major surgical affections were musculoskeletal disorders, cutaneous wounds, neoplasm, and different types of hernias, ophthalmic disorders, teat & udder, urogenital and gastrointestinal affections. Besides a number of elective surgeries such as castration, ovario-hysterectomy and disbudding etc. were also accomplished during the year.
2. **University dairy farm:** The department rendered its services promptly to the farm animals of university dairy farm as and when required.
3. **Clinical camps:** A total of 36 clinical camps were organized during the year 2002-2003 in different places including remote areas of Himachal Pradesh as part of ambulatory clinics course, NSS and in collaboration with State Animal Husbandry department, Indo-German project, Extension Directorate and Blue cross society, HP. Out of the total 1178 clinical cases presented, 188 surgical cases were attended there. The commonest surgical conditions in such camps include upward fixation of patella and different kinds of wounds. The common elective surgeries such as castration and disbudding were also performed.
4. **Emergency services:** The experts of the department provided emergency services to the farmers at their doorsteps and also livestock farmers as and when required. A large number of cases were attended during holidays and off hours.
5. **Consultancy services:** The consultancy services were available round the clock without any charges. The consultancy services rendered to the livestock owners at veterinary clinics, clinical camps and at farmer's door whenever required.

6. **Educational lectures to livestock owners:** A total of 12 educational lectures regarding veterinary surgery were delivered to livestock owners visiting to the university as part of various kinds of training programmes organized by different agencies like DEE and DRDA.

7. **Wild-life health services:** Many wild animals brought to the clinics by the concerned authorities were given surgical attention during the same year. Besides, staff members were also deputed to attend the wild animals at various Zoos of state as and when required.
8. **Radio- talks:** During the period 2003 -2004 four radio talks were delivered at AIR Dharamshala on different common interest subjects aimed to keep people informed about the welfare of their animals.

DEPARTMENT OF LIVESTOCK PRODUCTS AND TECHNOLOGY

Teaching Activities

The department offered three courses to veterinary undergraduates as per VCI regulations. Internship Training to interns of College of Veterinary and Animal Sciences is imparted in the field of animal products (milk, meat, egg and wool) processing, preservation and quality evaluation. The interns are also trained in slaughterhouse practices, carcass grading and evaluation.

Research Activities

NATP Project On , "Processing Of Different Hair Wool For Valued Added Products"

The department executed a National Agricultural Technology Projects entitled, "Processing of different hair/wool for value added products" worth Rs 22.26 lakhs. The project was started at this centre with C.S.W.R.I., Avikagar as lead centre in November 2000 with the following objectives

Work Carried During The Reporting Year

Blending Of Cross-Bred Gaddi Sheep Wool And Yak Hair

The procured cross-bred Gaddi sheep wool was blended with yak hair in proportions of 0:100, 85:15, 70:30 and 50:50. The blends were carded to prepare sliver at Shivani wool carding Industry, Kullu. The losses observed in the developed blends were recorded (Table 1). The losses observed in opening and carding were highest (38.0%) in the sliver prepared by using yak hair only while minimum losses (10%) were recorded in sliver prepared by blending cross bred Gaddi sheep wool and yak hair in the ratio of 85:15 respectively. Hence, it was observed that looses increased with increase in incorporation of yak hair in the blend.

Spinning Of Different Blends Of Cross Bred Gaddi Sheep Wool And Yak Hair

The slivers prepared by blending of Cross-bred Gaddi sheep Wool and Yak hair in different ratios, as shown in Figs.1-4, were hand spun for yarn preparation by the local artisans and losses observed during spinning were recorded (Table 2). Spinning losses were the highest (9.10%) in blend of cross bred Gaddi wool and yak hair in the ratio of 70:30 respectively while minimum losses were recorded in spinning yarn from sliver prepared by yak hair only.

Losses during opening, mixing and carding of yak hair and cross bred Gaddi sheep wool blends

Blend composition (sheep wool: yak hair)	Initial Weight of the blend (g)	Final weight of the blend (g)	Per cent loss after carding
85:15	1,500	1,350	10.0
70:30	1,500	1,230	18.0
50:50	1,500	1,210	19.3
0:100	1,000	620	38.0

Analysis Of Yarn Prepared By Blending Cross Bred Gaddi Wool And Yak Hair

The yarn prepared by hand spinning by local artisans was evaluated for different physical properties from CSWRI, Avikanagar. The fineness of yarn increased with increase in percentage of yak hair in the blend. However, maximum fiber diameter was recorded in yarn prepared by blending cross bred Gaddi wool and yak hair in the ratio of 70:30 respectively.

Physical properties of yarn prepared from cross bred Gaddi wool & yak hair blends

Wool: Yak Hair	Parameters		
	Tenacity (g/tex)	Breaking Extension (%)	Yarn Count (Nm)
0:100	2.081	13.0	4.22
50:50	1.509	42.8	3.62
70:30	1.503	34.5	4.69
85:15	2.362	43.7	4.48

Preparation Of Shawls Using Different Blends Of Yak Hair And Cross Bred Gaddi Sheep Wool

The yarn of different blends of wool: yak was used to prepare shawls by the local artisans in the Kangra district. The blended yarn was used as weft whereas warp in all shawls comprised of pure wool. The specifications of the shawls prepared by developed blends were recorded

Specifications of Shawls prepared from blending cross bred Gaddi sheep Wool and Yak hair

Specifications	Cross bred Gaddi sheep wool : Yak hair Blends			
	85:15	70:30	50:50	0:100
Weight of the shawl (g)	510	550	585	665
Length of the shawl (inches)	68	72	70	68
Width of the shawl (inches	45	45	45	46
Weight of warp (g)	120	120	120	120
Weight of weft (g)	390	430	465	545
Picks per inch	38	24	26	26
Ends per inch	21X	24	24	26
Weave of the shawl	2×2	2×2	2×2	2×2

The shawls prepared from all the blends were higher in weight because the yarn spun by local artisans was quite thick which was used as weft. Table 5 reveals that most of the weight of shawls was because of weft. The yarn used in all the blends was same and comprised of pure wool.

Extension Activities

The department was actively involved in extension activities and delivered **about 10 extension lectures/practical demonstrations** to the unemployed youth and women farmers under trainings organized by Directorate of Extension Education, CSKHPKV Palampur. Apart from extension lectures, **one Radio talk** was also delivered for All India Radio, Dharmshala on, "Nutritive value of milk, its preservation and preparation of different milk products". Exhibition stall showing the mandate and activities of the Department was displayed on the Silver Jubilee function of CSK HPKV, Palampur

Publications:

1. V.Pathak, Manish Kumar and R.B.Sharma (2003) Development and acceptability of rabbit meat patties with different levels of whey protein concentrates. *Himachal Veterinary Journal* **5:** 21-23
2. V.Pathak, Manish Kumar and A.Prashar (2003) Yak: an unexploited source of livestock products. *The Veterinarian* (Accepted)

Papers/abstracts presented/published in Conferences/Symposiums:

1. Manish Kumar and V.Pathak (2003) Processing of low-fat chevon patties incorporated with milk proteins. National Symposium on **"**Food and Nutritional Security: Technological Interventions and Genetic Options" held at CSKHPKV Palampur, September 18-19, pp199
2. V.Pathak and Manish Kumar (2003) Effect of incorporation of texturized soy proteins (TSP) on proximate, processing and sensory properties of poultry meat balls. National Symposium on **"**Food and Nutritional Security: Technological Interventions and Genetic Options" held at CSKHPKV Palampur, September 18-19, pp201
3. Anshu Sibbal, Manish Kumar and V.Pathak (2003) Microbiological and sensory quality of low-fat ground patties during storage. National Symposium on **"**Food and Nutritional Security: Technological Interventions and Genetic Options" held at CSKHPKV Palampur, September 18-19, pp209

Manuals

Two practical manuals were prepared for the courses LPT-311 (Milk & Milk Products Technology) & LPT-411 Meat & Meat Products Technology (Including Poultry Products Technology)

Training/workshops Attended / Organized

Dr. V.Pathak attended training on, "Personality development and student Counselling" at College of Agriculture, CSKHPKV-Palampur from 08.10.2003 to 15.10.2003

Conferences/Symposiums attended:

Dr Manish Kumar and Dr Vikas Pathak attended the National symposium on Food and Nutritional Security: Technological Interventions and Genetic Options held at CSKHPKV Palampur, September 18-19, 2003.

DEPARTMENT OF ANIMAL REPRODUCTION, GYNAECOLOGY AND OBSTETRICS

Teaching activities

Undergraduate Courses: The department offered 16 credit hours prescribed courses to the undergraduate veterinary students in Andrology, Gynaecology & Obstetrics, Biotechnology etc. besides the ambulatory clinics, clinical camps, clinical practice etc**.**

Post Graduate Courses: Five students completed their M.V.Sc. in this year. Offered 20 credit hours courses to PG students (major/ minor courses).

Internship Programme: The teaching faculty of the department is also involved in imparting practical training to the undergraduate students in the final semester undergoing a compulsory six months internship.

Research Activities

State funded projects:

The department is though running two state funded projects entitled "Incidence, etiology and management of repeat breeding in cross breed cattle of Himachal Pradesh and Infertility in cattle and buffaloes" but for last four years only meager funds have been allocated in these projects. Some research work was conducted within the available resourses and the salient findings were:

Managemennt of anestrous with progestagens and clomiphene citrate :

The study was conducted on 40 anestrous cows. Twenty animals recieved norgestomet (Crestar) ear implants alongwith an injection of 3mg norgestomet and 5mg estradiol valerate on the day of implant insertion. The implant was removed on 10^{th} day. The animals were inseminated with frozen thawed semen at,72 and 96 hours after implant removal. Another group of 20 animals were fed 300mg clomiphene citrate daily for five days. All the animals of norgestomet group were successfully induced in estrus and overall 45% conceived during induced and subsequent cycles. Where as poor induction of estrus was observed in clomiphene treated cows with only 25% of the animals conceiving. It was concluded that anoestrus could be effectively treated with norgestomet Implants where as clomephene citrate was not found effective even under best managemental conditions.

Repeat Breeding:

It was observed that the incidence of repeat breeding had increased during the past few years. This was mainly attributed to faulty A.I. technique. Lack of sterilization of the A.I. equipments and A.I by the unqualified or inadequately qualified persons was one of the major factors responsible for conception failure under field conditions. This has also resulted in increase incidence of endometrites, cervical fibrosis and ovaro-bursal adhesions.

In-vitro culture of sheep oocytes:

1. Slicing was an effective method of obtaining good quality oocytes from sheep abattoir ovaries.
2. Both left & right ovaries were equally functional.
3. The optimum time for *in- vitro* culture of ovine oocytes in TCM-199 was 27 h. at 38.5^{o} C in CO_2 incubator.
4. The freshly ejaculated Ram sperms could be capacitated *in-vitro* with in 45 min of incubation in Brackett and oliphant media.

Extension activities

Veterinary Clinic:

Total number of Gynecological cases presented: 1187, Gynecological cases treated: 641 and the number of animals inseminated: 546

Gynecological cases treated includes various reproductive disorders i.e. anestrous and repeats breeding and obstetrical problems viz., dystocia cesarean section, and induction of parturition, uterine torsion, cervico-vaginal and post-partum uterine prolapse and retained foetal membrane. Prolonged estrus was observed in most of the repeat breeding crossbred animals followed by endometeritis.

Veterinary Clinical Camps:

A total of 35 clinical camps were attended in different parts of state and total 509 Gynecological cases were treated**.** Anoestrus, repeat breeding and delayed puberty were the main problems encountered. Farmer's education was one of the aspects covered during clinical camps.

Ambulatory Clinics:

The students were taken to different villages on every Saturday to fulfill two ways objective of teaching and service to the farmers. The awareness was created amongst the students for working and diagnosis of prevalent reproduction problems under field, conditions, and farmers were educated regarding better reproductive management of crossbred cattle and buffaloes.

Service to University Livestock Farm:

Complete reproductive health coverage was provided (including A.I., pregnancy diagnosis and obstetrical cases to livestock farm, CSK HPKV, Palampur. Every attempt is made to pay individual attention to every animal in order to curb the economic losses and if desired suitable intervention at the expense of the department is routinely employed.

Experiments have also been conducted to improve conception rates using scientific techniques and hormones by well-planned short-term projects out of departmental funds.

Emergency Duty:

Emergency cases were attended during late hours and during holidays and farmers were provided with accommodation even during late hours.

Extension Training programme

In the extension training programmes for the women of Solan and Mandi districts, organized by the Directorate of Extension Education, CSK HPKV, Palampur, Dr. N.K.Vasishta and Dr.Madhumeet Singh delivered lectures and conducted practical demonstrations.

Radio Talks:

Dr. Madhumeet Sigh delivered five radio talks from All India radio Shimla and Dharamshala and Dr. Navneet Kumar Vashisht delivered one during the year.

Publications/Presentations in 2003-2004

1.Sood,P., Vasishta,N.K. and Madhumeet Singh (2003). Schistosoma reflexus in a cow. Himachal Vet. J. **5** : 26-27

2.Madhumeet Singh, Sharma,R., Singh,K.D., Vasishta,N.K. and Sood,P. (2003). Management of fetal mummification in a cow – a case report. Himachal Vet. J. **5** : 34-35.

3.Katoch,R.C., Madhumeet Singh, Verma,S., Gupta,V.K., Sharma,M. and Vineeta Almadi (2004). Genital tuberculosis in a Jersey crossbred cow. Indian Vet. J. **81**: 216-217.

4.Rajesh Sharma, Navneet Vasishta, Madhumeet Singh & Pankaj Sood (2004). Efficacy of equine Chorionic Gonadotropin for superovulation of Gaddi ewes during non breeding Season. Indian Vet. J. **81**: 838-839.
5.Navneet Kumar, Paramasivan, S, Pankaj Sood & Madhumeet Singh (2004). Micrometery of different category oocytes recovered from goat ovaries. Indian J. Animal Sci. **74** : 259-260.
6.Pankaj Sood, Madhumeet Singh, Vasishta N.K. and Ramesh Kumar (2004) Phenolsulphonphthalene test to evaluate the lesions of the fallopian tubes in infertile cows. Indian J. Animal Sci. **74**: 270-271.
7.Kumar N, Singh M, Sood P and Paramasivan S Evaluation of oocytes recovery rates and their quality during non breeding season in goats. Vets India **4:** 10-13
8.Rajesh Sharma and Navneet Vasishta (2004).Emerging trends in reproductive biotechnology. Seminar on Emerging trends in veterinary practices,.Shimla 20.02.04.pp 3-6
9.Navneet Kumar and Madhumeet Singh. (2004). Management of infertility in dairy animals. Presented in Seminar on Emerging trends in veterinary practices,.Shimla 20.02.04.

DEPARTMENT OF VETERINARY BIOCHEMISTRY

Biochemistry is fundamental to an understanding of modern life science and all students need to study this subject as a major subsidiary to their main disciplines of Veterinary and Animal Science. Students enter Veterinary profession with a substantial knowledge base from their previous education. The objective of teaching Biochemistry is to broaden that knowledge base of students to the point where students who have completed a year of professional training in Veterinary and Animal Sciences can read and understand their professional literature and continue educating themselves. Besides, a veterinarian also needs a sound knowledge of biochemistry to confront the central concerns of health sciences in practice and research.

Teaching Activities:

The department offered 10 credit hours to the Under graduate students of the B.V.Sc & AH. The department has formulated the postgraduate courses to be offered as minor subject to the PG students of other disciplines. The courses have been approved and shall be offered from this academic year i.e. 2004-05.

Research Activities:

The department could not initiate any research activity for want of minimum staff and infrastructural facilities. A research project is currently being prepared for the next year.

Trainings

Dr. Naresh Kumar, Assoc.Prof. attended the following workshops/ trainings during the year.

1. **Orientation Workshop on the Use of University Network Services for UNS Users** organized by Incharge Library Automation and LAN Up gradation-cum-Nodal Officer, CSK HPKV, Palampur, on **June 02, 2003.**
2. **Training Workshop on Personality Development and Student' Counselling** organized by Students' Counselling and Placement Cell, CSK HPKV, Palampur, from **October 8-15, 2003**.
3. A one-day seminar on **IPR awareness under the scheme for Intellectual Property Education and Public Outreach,** organized by Advanced Centre for Hill Bioresources & Biotechnology, CSK HPKV, Palampur on **March 26, 2004**.

DEPARTMENT OF VETERINARY EPIDEMIOLOGY & PREVENTIVE MEDICINE

This department was created in 1996 as one of the four constituent clinical departments of the College of Veterinary & Animal Sciences. However, came in to practical existence with the appointment of one Assistant Professor in October, 1998 & subsequently one Associate Professor in March, 2000.

Teaching Activities:

The Department offered 10 credit hours to B.V.Sc & AH students as per VCI recommendations. Besides teaching courses offered by this department in the first semester, course of **Vety. Microbiology VMC-311 (2+1)** was also taught.

In addition to the above courses, the staff member of this department were also engaged in six months Compulsory Rotational Internship Programme to 5th B.V.Sc. & A. H. students

Departmental activities:

Besides teaching under-graduate students, the department is actively involved in the diagnosis & treatment of animals suffering from various infectious diseases in Vety. Clinics, Livestock farms and under field conditions.

Emergency Services

The faculty of the department also provided emergency services on Sunday & holidays in the Veterinary Clinical Complex of college during the period under report.

Disease Diagnostic & Investigation Services:

During the period under report two animal disease out breaks were attended at the farmers doorsteps.

FMD outbreak at Kachhayari (kangra)

20 HF cross-bred cows and a buffaloe that had suffered from foot & mouth disease in the 2nd week of November 2003. A total of 8 calves had died due to this outbreak. On investigation it was found that the owner was maintaining an open herd and outbreak occurred upon the introduction of a recently purchased cow from adjoining state. It was the newly introduced animal that developed the symptoms and lesions of FMD followed by other inhabitants. As a sequelae, a cow developed sub-clinical mastitis and another teat wounds. *Staphylococcus sp*. could be isolated from teat wound that was moderately sensitive to Chloramphenicol, Ciprofloxacin and Gentamicin but resistant to Penicillin, Ampicillin & Amoxycillin.

Bacterial Gastro-enteritis among monkeys (Shimla)

18-20 both adult and young monkeys had died till 29th June 2004 in Jakhu area near Hanuman mandir at Shimla. Post mortem examination of dead monkeys on the spot were suggestive of catarrhal gastroenteritis. On laboratory investigations, all internal viscera except intestinal loop were bereft of any bacterial involvement. However, intestinal contents yielded both gram positive and Gram negative bacteria in abundance. These isolates were sensitive to Pefloxacin, Tetracycline, Norfloxacin, Enrofloxacin and Ciprofloxacin but resistant to Erythromycin, Nitrofurantoin, Ampicillin, Amoxycillin, Cloxacillin and Trimethoprim. Treatment with Tetracycline granules resulted in eventful recovery

Screening of bulls for infectious Diseases

All the bulls of the Semen Processing Laboratory, Animal Husbandry department, Palampur were screened for bacterial infections such as Brucellosis, tuberculosis and Johne's Disease. All the animals were found to be free from these infectious diseases.

Research Activities

Continuous efforts are being made to create infrastructure for research in the department. Since the department is infancy, needs special emphasis to fill up sanctioned posts of scientists as well as one time special grants to create bare minimum facility for research.

Extension Activities:

A total of five specialist lectures were delivered by faculty member of department, in the training on Livestock Production and health for registered dairy breeders of Solan & Mandi districts under Livestock Production Improvement Project, DRDA and youth of state for self employment, organized by the DEE, CSKHPKV, Palampur.

List of Publications:

1. R.C. Katoch, Rajesh Chahota, Mandeep Sharma & K.B. Nagal. (2002). Chlamydiosis in livestock of H.P. In proceedings of 'International Symposium on sustainable agriculture in hill areas' held at HPKV, Palampur, October 29-30, 1998 pp 225- 232. Edited by A.C.Kapoor
2. Joshi, V.B.; **K. B. Nagal**. R.C. Katoch; and M.K. Batta. (2003). Confirmation of *Chlamydia psittaci* isolates by dot-enzyme linked immunosorbant assay (Dot-ELISA) and indirect micro immunofluorescence (IMIF). *Indian J. Amin. Sci.* **73** : 506-507.
3. Internship dissertation and presentation on "Prospects of Subunit vaccines in Veterinary Practice" was submitted by Mr. Vishal Patil (V-98-04-48) under the Project Advisory of Dr. K.B. Nagal

Summer School / Short term trainings:

Dr. K.B. Nagal, Associate Professor and Head of this department attended a Short term training course on " New Generation Veterinary Vaccines" from March 09-29, 2004 organized by National Biotechnology Center, Indian Veterinary Research Institute, Izatnagar – 143 122 (UP).

DEPARTMENT OF VETERINARY AND ANIMAL HUSBANDRY EXTENSION

The Department of Veterinary and Animal Husbandry Extension was created in 1999 to fulfill the minimum requirements of Veterinary Education as prescribed in the Indian Veterinary Council Act 1984. The Department aims to educate the Veterinary graduates for applying technical concepts of behavioral sciences for the transfer / dissemination of available technology in the field of Veterinary Science and Animal Husbandry. This is very significant in view of the fact that the extension approaches for the Veterinary Science and Animal Husbandry are significantly different from those of allied sciences like Agriculture, Horticulture and Home Sciences, in having less operability at the users' level and low communicability to the users.

Strengthening of Facilities for Audio-Visual Technology Lab and Teaching Activities:


Digital movie editing Unit

Efforts were continued to develop a well-equipped Audio-Visual Technology Lab for a systematic Teaching in modern communication technology to the graduate students. **Digital Photography** practical lessons are being imparted to the graduate students with the help of Digital Camera purchased this year. LCD **Multimedia Projector** was purchased and has been used for research, extension and teaching activities. Lessons in **Video-film recording, production and Script writing** have been prepared and the same were included in extension

teaching during the year under report. In addition CTR cassette-dubbing recording equipment was purchased to strengthen the proposed Audio Visual lab. These topics are covered in addition to the prescribed VCI curriculum, so that the students from the college are well exposed to the latest communication systems / techniques. The department also initiated efforts to establish a Videocassette library on varied topics of interest for the students as well as farmers related to veterinary and animal sciences.

A new AV/DV Pinnacle **Computerized Movie Editing Unit** was added to the Audio Visual laboratory of the Department for preparing multi media based tutorials for teaching, research and extension. The unit so purchased will be useful for disseminating the latest know how in field of animal Husbandry to the farmers of the state by preparing documentaries on varied fields. In the first phase since its purchase the following documentaries were produced.

Sr.No.	Topic	Duration	Format	Objective
1	Research Trial on Probiotics in Poultry	5 Min	Documentary	Research
2	Outbreaks and veterinary clinical camps	5 Min	Documentary	Extension
3	College of veterinary and animal sciences	8 Min	Documentary	Extension
4	Research activities of department of Fishery	5 Min	Documentary	Extension
5	Research activities of department of Veterinary Microbiology	5 Min	Documentary	Extension
6	Preparation of Chicken patties- value addition to chicken	6 Min	Documentary	Extension

Apart from the above documentaries, the department envisages to produce documentaries on Dairy farming, Poultry farming, Fish farming, UMMB Brick production, Preparation of feed etc in the next phase. The students will be trained in extension Video film making under the course AHE-411.

Research activities

ON-GOING RESEARCH PROJECTS

The faculty members are working as Co-PI in the following projects:

I. Dr. Alok Sharma is Co-Investigator in the NATP research project entitled "Improvement of Migratory Sheep Production".

II. Dr. Shivani Katoch is Co-Investigator in the NATP research project entitled "Evaluation and Improving Locally Available Feed Resources and Developing Feed Systems For Improved Livestock Production**".**

Production of video-teaching material

The department provided its exclusive facility of Video Photography to other departments of the College/ University for preparing teaching material, recording research observations, and during scientific meetings / conferences etc.

Apart from this the Digital camera, Multi Media projector was provided to other departments for research and seminar purpose, the detail is as follows:

Extension lectures delivered:

Extension Talks delivered by the Department Faculty for the Livestock Farmers / Para-Vets / Trainee groups under different Rural Development Schemes :

Animal husbandry extension education services

Imparted extension education services in the form of interactive discussions and informal *goshthis* to the livestock owners Till date the Departmental has had Interactive discussions and interpersonal counseling to a total of 8345 farmers since its inception through the various clinical camps, Livestock shows, Interactive Sessions in the Veterinary Extension Museum and *Kisan melas*. Similarly, visitors comprising of Farmers sponsored by the DRDA, SSB, NATP, Veterinarians and Dignitaries etc have till date visited the Exhibition room maintained by the Department highlighting the progress made in the different spheres of Veterinary and Animal Husbandry.

Other extension related activities

1. Counseling and Consultancy support was provided on different aspects of Veterinary Health and Animal Husbandry to the NGO and State Deptt. of Animal Husbandry (HP)
2. **Extension Literature Support** on different aspects of Veterinary Health and Animal Husbandry was provided to the following agencies / departments :
   a. HP Wool Federation- Shimla
   b. Special Services Bureau (Ministry of Home Affairs) sponsored Para-veterinarian staff from the borders states of India
   c. State Deptt. of Animal Husbandry, HP.
   d. District Rural Development Agency, Solan.
   e. District Rural Development Agency, Mandi.
   f. Deputy Director (AH), Kangra and Chamba
   g. NATP cell- Shimla
   h. NGOs, Livestock Keepers Societies
   i. Indo-German Changar Eco-Development Project, Palampur
3. Queries of farmers relating to problems in Animal Husbandry were answered through **Helpline for Farmers**, a regular feature of *Divya Himachal* news paper.
4. New, up-dated Visual Exhibits highlighting the activities of all constituent departments of the college prepared and exhibited during the *Kisan Mela* of CSKHPKV, Palampur in the month of February 2004. The material is now on display in the Exhibition Hall of the department for the benefit of the visitors / trainee groups / livestock farmers.
5. Value-Added Agromet Information for the farmer :
   Weekly bulletins of Animal Health –related practices were provided for the dedicated Web-page. The information pertaining to the anticipated livestock health problems as a result of the climatic variations was regularly supplied for updating of the web-site.
6. Consultancy to the Migratory Sheep & Goat flock Owners **:** regarding preventive flock health management from time to time and linkages maintained with them *en route* to solve the immediate health problems of their flocks.
7. Training of Village-Level Animators under Indo-German Changar Eco-Development Project, Palampur **:**
   Day-long interactive sessions were conducted with selective groups of Village Level Animators / Progressive Livestock Farmers sponsored by IGCP Palampur at the following places. The range of topics covered different practical solutions to the Feeding, Breeding, Health and Production / Marketing –related problems faced by the farmers in the Changer area.

PARTICIPATION IN WORKSHOPS / SYMPOSIA / TECHNICAL MEETINGS

Sr. No.	Title	Dates	Organized by	Participant
1	XXII National Conference of Indian Poultry Science Association and National Symposium	April 7-9, 2004	Deptt. of Animal Nutrition, COVAS, HPKV, Palampur.	Dr. Shivani Katoch
2	Personality Development and Public Relations	8-10-03 to 15-10-03	COA, CSK HPKV, Palampur	Dr. Shivani Katoch
3	Short Summer Course on 'Recent Advances in Cold water Aquaculture'	22-9-03 to 1-10-03	Department of Fisheries, COVAS, Palampur	Dr. Shivani Katoch
4	Seminar on IPR Awareness	26-3-04	Centre for Hill Biotechnology HPKV, Palampur.	Dr. Shivani Katoch
5	Orientation Workshop for New CSKHPKV Website	7/11/2003	UNS cum Nodal Officer (NATP), CSK HPKV	Dr. Alok Sharma
6	Training on Organic Farming	March 19-25, 2004	Centre for Human Resource Devpt, CSK HPKV, Palampur	Dr. Alok Sharma
7	Co-ordination Assessment and Planning Meeting	26/6/2004	Himachal Pradesh Eco-Development Society	Dr. Alok Sharma

RADIO TALK

A radio talk (*Hindi)* by **Dr. Shivani Katoch** on **'Infectious Diseases of Cattle and their Management'** was broadcast on 21-5-04 by All India Radio Dharamshala, HP.

MISCELLANEOUS ASSIGNMENTS:

i. The departmental faculty members provided Editorial and Visual support to prepare the **College Annual Report *for the fifth consecutive year*** :
Dr. Alok Sharma : Editor and provided Visuals/ Design inputs
Dr. Shivani Katoch : Visuals/ Design inputs (including cover / Title page)

ii. **The College Magazine** – '**Blue Cross 2003' :**
Dr. Alok Sharma : Editor and provided Visuals/ Design inputs
Dr. Shivani Katoch : Visuals/ Design inputs (including cover / Title page)

iii. **Evaluation Mission of Indo-German Changer Eco-Development** Project : held on 21/04/2004 : Dr. Alok Sharma was invited member to speak for the Animal Health contribution of the HPKV

iv. The Web site of the Department, and College was prepared and launched.

Publications

Papers published / presented :

1. Sharma, A. K. ; Panda, A. K., Khurana, S. K., Katoch, S. and Katoch, R. (2004). Prevalence of Brucellosis in *Spiti* horses in North-West Himalayas. *Centaur*: XX(4): 63-65.

2. Katoch, R., Bharadwaj, R. L., Rajput, R., Panda, A. K; and Sharma, A. K. (2004). Incidence of Bot in equines of North Western Himalayas. *Centaur*: XX(4): 66-67.
3. Panda, A. K., Katoch, R. and Sharma, A. K. (2003). Rabies : The public health significance in Himachal Pradesh. Proceedings of the 5th National Conference of the Association for Prevention and Control of Rabies in India (APCRICON) on Rabies, held at SCB Medical College Cuttack, Orissa; July 4-6, 2003; pp 41-42.
4. Panda, A. K., Bharadwaj, R. L., Katoch, R., Sharma, A. K. and Rajput, R., (2003). *In vitro* sensitivity of *Neem* oil, *Haldi* and Clove oil against common pathogenic micro-organisms. *2nd Annual Conference of Veterinary Public Health Specialists*, September 20-23, 2003.
5. Panda, A. K., Khurana, S. K., Katoch, S. and Katoch, R. and Sharma, A. K. (2003). Prevalence of Brucellosis in *Spiti* horses in North-West Himalayas. *2nd Annual Conference of Vety Public Health Specialists*, September 20-23, 2003.
6. Shivani Katoch, Mukul Kaistha, K.S. Sharma, Meena Kumari, B.S. Katoch. Biological Performance of chicken fed newly isolated probiotics. *Indian Journal of Animal sciences*, 73 (11): 1271-1273, November-2003 (2001).
7. Shivani Katoch, Mukul Kaistha, K.S. Sharma, Meena Kumari, B.S. Katoch. Effect of directly fed microbial isolated and cultured from vegetable sources on the biological performance of laying pullets. Presented orally in the XXII Conference of Indian Poultry Science Association held at CSKHPKV, Palampur w.e.f April 7-9, 2004.
8. Shivani Katoch, , K.S.Sharma, Daisy Wadhwa, V.K. Sharma, Meena Kumari, B.S. Katoch. Biological performance of chicken broiler fed newly isolated probiotics under varying environmental conditions. XXII Conference of Indian Poultry Science Association. Souvenir and Abstract, NFT-1.49, PP-53, held at CSKHPKV, Palampur w.e.f April 7-9, 2004.
9. B.S.Katoch , Madhur Gupta, Shivani Katoch, Meena Kumari, K.S. Sharma**.** Effect of intermittent dietary supplementation of combination of different strains of Lactobacilli, Streptococci and Yeast isolated from different sources vis-à-vis the combination of their standard counterparts on the growth performance of commercial egg laying chicken from 1 to 18 weeks of age. XXII Conference of Indian Poultry Science Association. Souvenir and Abstract, NFT-1.65, PP-62, held at CSKHPKV, Palampur w.e.f April 7-9, 2004.

Books / Manuals :

1. Sharma, Alok (2004). *ORGANIC LIVESTOCK PRODUCTION : BASIC CONCEPTS AND KEY PRACTICES.* Manual being published by Centre for Human Resource Development, CSK HPKV, Palampur; pages 1-94.

2. Shivani Katoch (2004). Extension Book; *SHEEP BREEDERS' TRAINING MANUAL.* Published by H.P.Wool Federation Shimla.

CONTRIBUTION TO COLLEGE MAGAZINE : **BLUE CROSS 2003 :**

Following articles were contributed for the College Magazine – BLUE CROSS 2003

1. A Tribute to Rosalind Franklin : 'The 'Dark Lady of DNA'. (Dr. Alok Sharma)
2. A Genius called 'Robert Gallo'.(Dr. Alok Sharma)

Extension Publications- Popular Articles :

1. Sharma, A. and Sharma, P. C. (2004). *Dairy Pashooan wich afara ate langara bukhar : kaaran, ilaaz ate bachaav; Dairy Darpan (March 2004)* 9: 10-17.
2. Sharma, A. *(2004)* : *Dairy pashooan wich gal ghotu rog te us ton bachaav.* Submitted for publication in *Dairy Darpan.*

3. Sharma, A. and Yadav, G. (2004) : *Dudharoo pashooan de leyi upjogi dainik karya-kalaa.* Submitted for publication in *Dairy Darpan.*
4. Sharma, A. and Kumar, A. (2004) *Bachhrian de mukh rogan to kinwhe bachaav kariye ?* Submitted for publication in *Dairy Darpan.*
5. Sharma, A. (2004). *Moonh pakaa, khur pakaa rog te us ton bachaav.* Submitted for publication in *Dairy Darpan.*
6. Sharma, A. and Katoch, Shivani (2004). *Sardiyan wich bachhade-bachhadian di dekhbhaal kinwhe kariye.* Submitted for publication in *Dairy Darpan.*
7. katoch, Shivani. (2004). *Sheep Calendar* in Hindi. A folder printed by H.P. Wool Federation, Shimla

DEPARTMENT OF VETERINARY ANATOMY & HISTOLOGY

Teaching Activities

The faculty members of the department were engaged in teaching of B.V.Sc & AH. Besides under graduate teaching, 10 credit hours were offered for Post graduate teaching

Research Activities

An ICAR Adhoc Research project on "Effect of the Season on the Histology and Histochemistry of the Male Genital System and the Pineal Gland of the Gaddi Goat and Gaddi Sheep" is running in the Department. The project was started in the department from Ist June, 2003

Departmental Research Activities

Gross and Topographic Anatomy of the kidney of a mule was done and it was observed that the left kidney was heavier and larger than the right kidney. The position of both kidneys was same except that the left one's caudal border was slightly posterior. The right kidney was heart- shaped while the left was bean-shaped as in other equines.

Gross Anatomical studies on the spleen of a mule showed comma- shaped spleen. It was lying along the left abdominal wall and extended from 17^{th} rib to 4^{th} lumbar vertebra. The parietal surface had impressions of 13^{th} to 17^{th} ribs. The hilus was present on the visceral surface extending to almost entire length of the organ except 2.5 cm near the base of the spleen.

Anatomy of the skull of Sambar and orbitometry of indian Swine ware also reported.

Participation in Workshops/Conferences/Trainings:

1. Dr.L.S.Sudhakar attended the XVIII Annual Convention of IAVA and National Symposium on "Recent Advances in Veterinary Anatomy and their Applications in the field of Animal Health, Production and Biotechnology" held in The Department of Anatomy & Histology, Veterinary College, Anand (Gujarat) on December 26-28, 2003.
2. Dr.R.L.Bhardwaj, Dr.Archana Pathak and Dr.Rajesh Rajput attended the training on "Personality Development and Student Counselling" organized by College of Agriculture of our University on October 8-15, 2003.
3. Dr.Archana Pathak participated in the Workshop on "Women in Agriculture" organized by Department of Agriculture (H.P.) at this place held on May 21-22, 2004.

4. Dr.Virender Pathak attended the workshop on "Extension Methodology" organized by Extension Education Institute, Nilokhedi (Haryana) at this place on June 3-10, 2004.

Radio Talks and other activities:

A radio talk of Dr.Archana Pathak was recorded on AIR, Dharamshala on 23.5.2004 on "Paltu Pashuon Mein Khur Ke Rog, Karan Evam Nivaran"

List of Papers Published

i) Rajesh Rajput, Bhardwaj, R.L. and Sharma,D.N. 2004. Gross Anatomical Studies on the Spleen of a Mule. Centaur(3): 50-51.

ii) Bhardwaj, R.L., Rajesh Rajput and Sharma,D.N. 2004. Gross and Tropographical Anatomy of the Kidney of a Mule Centaur (3): 52-53.

List of Papers presented in the Conferences/Symposia

Dr.L.S.Sudhakar, Professor presented the following papers in the XVIII Annual Convention of IAVA and National Symposium of Anatomy on "Recent Advances in Veterinary Anatomy and their Applications in the field of Animal Health, Production and Biotechnology" held in the Department of Anatomy and Histology, Veterinary College, Anand on December 26-28, 2003.

1. Histomorphology of the salivary glands of yak – A preliminary study.
2. Perspective and Plans for Education and Research in Veterinary Anatomy.
3. Interdisciplinary Approaches to Anatomy.

MANUAL

A manual entitled, "Comparative Anatomy of the Digestive System of Equine, Bovine and Canine" was prepared by Dr.R.L.Bhardwaj along with Dr.Adarsh Kumar (of Surgery Department).

DEPARTMENT OF LIVESTOCK PRODUCTION AND MANAGEMENT

Teaching activities

With the faculty strength of three teachers, the department offered thirteen UG courses (Total 28 credit hrs.) to the students of COVAS, COA and COHS. Out of these, nine UG courses (19 credit hrs.) were offered to the students of COVAS, which constituted about 13 percent of the total credit load for entire B.V.Sc. & A.H. programme. Two UG courses each were offered to the students of COA (6 credit hrs.) and COHS (3 credit hrs.). The practical component attached with each of these courses were effectively taught / demonstrated at the farms of different livestock species of the college. A UG laboratory was also established at the Livestock Farm premises. Besides, Dr. (Mrs.) Saroj Bala (Assistant Professor) worked as Programme Officer (NSS unit of the college) till November, 2003.

Research Activities

Though there is no independent project operational in the department, yet the faculty members are actively engaged in different research projects being in operation under different departments of COVAS.

Extension Activites

The department was actively involved in extension activities and the faculty members delivered 34 extension lectures/practical demonstrations to the unemployed youth and women farmers under different training programmes organized by Directorate of Extension Education, CSKHPKV, Palampur. Exhibition

stall showing the mandate and activities of the department was displayed on the Silver Jubilee Function cum Kisan Mela of CSK HPKV, Palampur.

Training / Workshops attended

1. Dr. P.K. Dogra (Associate Professor) attended training on, "Personality development and student Counselling" at College of Agriculture, CSKHPKV-Palampur from 08.10.2003 to 15.10.2003
2. Dr. (Mrs.) Saroj Bala (Assistant Professor) attended training on, "Personality development and student counseling" at College of Agriculture, CSKHPKV-Palampur from 08.10.2003 to 15.10.2003
3. Dr. P.K. Dogra (Associate Professor) attended "National symposium on livestock biodiversity vis-à-vis resource exploitation: an introspection", held at NBAGR, Karnal. February 11-12,2004.
4. Dr. C.L. Marwaha (Professor) attended "National symposium on livestock biodiversity vis-à-vis resource exploitation: an introspection", held at NBAGR, Karnal. February 11-12,2004.
5. Dr. P. K. Dogra (Associate Professor) attended "National symposium on conservation and propagation of livestock and poultry" held at G.B. Pant University of Agriculture & Technology, Pantnagar. Feb. 26-28, 2004.
6. Dr. (Mrs.) Saroj Bala (Assistant Professor) attended training workshop on Extension methodology for the Master trainers of CSKHPKV, Palampur, held at Palampur w.e.f. June 3-10,2004, organized by Extension Education Institute, Nilokheri (Haryana).

Research Papers Published

1. Dogra, P.K., Gupta, S.C. and Parmar, O.S. (2003). Effect of machine milking on production and milk quality in Murrah buffaloes. Indian Vet. Med. J. 27(2): 113-116.
2. Katoch, S., Dogra, P.K., Thakur. Y.P. and Gupta, K., (2004). Phenotypic characterization of spiti horses in its breeding tract – body measurements. Centaur. 20 (3):45-47.
3. Katoch, A., Katoch, S., Gupta, K., Dogra, P.K., Sharma, S.K. and Thakur. Y.P. (2004). Mineral and biochemical profile in spiti horses. Centaur. 20 (3):48-49.
4. Kumar, R., Katoch, S., Gupta, K., Katoch, A., Dogra, P.K. and Sharma, K.B. (2004). Hematological profile of migratory spiti horses. Centaur. 20 (3):54-56.

Papers presented in different Conferences / Symposia

1. Dogra, P.K., and Chauhan, S. K. (2004). Husbandry practices and constraints in equine rearing in the mountains. Paper presented in the "National symposium on livestock biodiversity vis-à-vis resource exploitation: an introspection" held at NBAGR, Karnal. February 11-12,2004. Abstr. No. AGR047, pp.128.
2. Chauhan, S. K. and Dogra, P.K. (2004). Economic aspects of equine husbandry in the mountain. Paper presented in the "National symposium on livestock biodiversity vis-à-vis resource exploitation: an introspection" held at NBAGR, Karnal. February 11-12,2004. Abstr. No. AGR046, pp.127.
3. Thakur, Y.P., Katoch, S., Dogra, P.K. and Gupta K. (2004). Livestock diversity in cold desert region of Himachal Pradesh – A study of Lahaul & Spiti district. Paper presented in the "National symposium on livestock biodiversity vis-à-vis resource exploitation: an introspection" held at NBAGR, Karnal. February 11-12,2004. Abstr. No. AGR101, pp. 98.
4. Katoch, S., Dogra, P.K., Thakur, Y.P. and Gupta K. (2004). Phenotypic characterization of Spiti horses in its breeding tract – coat colour pattern and markings. Paper presented in the "National symposium on livestock biodiversity vis-à-vis resource exploitation: an introspection" held at NBAGR, Karnal. February 11-12,2004. Abstr. No. AGR48, pp. 168.

5.Gupta K., Katoch, S., Marwaha, C.L. and Dogra, P.K. (2004). Study on morphological characteristics of Gaddi goat breed of cold arid zone of Himachal Pradesh. Paper presented in the "National symposium on livestock biodiversity vis-à-vis resource exploitation: an introspection" held at NBAGR, Karnal. February 11-12,2004. Abstr. No. AGR127, pp. 170.
6.Katoch, S., Dogra, P.K., Thakur, Y.P. and Gupta, K. (2004). Characterization of Spiti horse in its breeding tract: reproductive parameters. Paper presented in the "National symposium on conservation and propagation of livestock and poultry" held at G.B. Pant Univ. of Agric. and Tech., PANTNAGAR. February 26-28, 2004. Abstr. No. 49, pp 30.
7.Gupta, K., Kaila O.P. and Marwaha C.L. (2004). Growth pattern studies of Gaddi goat in cold arid zone of Himachal Pradesh. Paper presented in the "National symposium on conservation and propagation of livestock and poultry" held at G.B. Pant Univ. of Agric. and Tech., PANTNAGAR. February 26-28, 2004.
8.Gupta, K., Marwaha C.L. and Katoch, S.(2004). Study of physiological parameter and reproductive traits of Gaddi Sheep of cold and arid zine of Himachal Pradesh. Paper presented in the "National symposium on conservation and propagation of livestock and poultry" held at G.B. Pant Univ. of Agric. and Tech., PANTNAGAR. February 26-28, 2004.
9.Sharma V.K. and Marwaha C.L. (2004). Buffalo productivity and rearing practices prevalent in Himachal Pradesh. Lead paper presented in the National seminar on " Economic feeding and rearing of buffaloes under different agro-climatic regions". Held at IGFRI, Jhansi, March, 12-13, 2004.

Popular Articles Published

1.Radotra S., Dogra P.K. and Marwaha C.L. (2003). Bakree paalan: Doodh mein gandh ke karan va samadhan. . Giriraj Saptahik 27th Aug. – 2nd Sept., 2003. pp 5.
2.Neel Kant, Chadda, K.K., Kumar, R. and Dogra, P.K. (2004). Poultry production in Himachal Pradesh. Poultry Planner 5(6): 20-21.

DEPARTMENT OF FISHERIES

The Department with the mandate of Research, teaching and extension, has been vigorously conducting need-based research on different aspects of aquaculture pertaining to location specific problems confronting in the hill, States. The main thrust of this Department has been to evolve polyculture fish models for different agro climatic conditions, which could best be integrated with other agriculture and animal husbandry practices in the area. During the year a comprehensive list of 67 species of fishes from upland water has been augmented and catalogued. Besides, the polyculture fish model for the agro climatic zone-II i.e. mid hill region of the state has been refined. The economic return of this model is quite encouraging i.e Rs. 90,000 /hac./year as such 80 farmers of District Kangra, Hamirpur and Mandi have already adopted this technology for which the package of practices have been standardized and updated for the benefit of the farmers. This technology is being disseminated vigorously through the Directorate of Extension Education to the farmers of the state by organizing training camps, farmers visit to the fish farm of HPKV and by field demonstrations on the farmer's pond. Besides research, the Department is actively engaged in teaching and extension of fish culture to the farmers of the State.

ON GOING RESEARCH PROJECTS:

1.Growth performance of major carps under different ecobiological conditions and feed conversion ratio in zone-II of Himachal Pradesh. (H.P. State).

2.Studies on the genetic improvement of mirror carp and scale carp by selective breeding. (H.P. State)
3.Biology and growth performance of culturable species with special emphasis on cold water fisheries. (H.P. State).
4.Empowerment of women through aquaculture interventions. (DBT).
5.Aquaculture management in cold waters – Evaluation of Mahseer fishery potential and its farming feasibility for conservation in Himalayan region. (NATP, ICAR).
6.Revolving Fund Scheme.

Summary of Research accomplishment:

The salient out come of the projects carried out especially in respect of refinement of fish farming technology for upland waters is summarized as below:

1.The trials in replicate on relative growth performance of three exotic carps in the ratio of 2CC:2GC:1SC, based on low cost feed by replacing the fishmeal based diet with locally available soya-bean based diet registered the production efficiency of this model as 5.46 tons/hac./year, which is about 9% less than the previous year. However, the net profit is about 14% more than the previous years, which is because of the replacement of fish meal (a costliest fish feed ingredient). Genetic improvement of mirror carp and scale carp by selective breeding has also enhanced the growth performance and disease free strain of common carp.
2.Revolving fund scheme has been proved to be a viable model for income generation and demonstration of fish farming to the entrepreneur's/ farmers of mid hill. As a result the income of Department is enhanced to the tune of Rs. 1,35,367 during the year.
3.Based on the extensive survey of different water bodies in Himachal Pradesh, the status of Golden Mahseer has been ascertained and it is seen that no doubt, Mahseer species are depleted from some of the water bodies which have been dammed intermittently and stocked with exotic species. However, a sizable population of Mahseer species still thrives well in some of the tributary of River Beas and Giri where there is no threat to this species if human intervention is checked by enforcement of law. It would be a futile exercise of producing large scale seed of Mahseer in the hatchery and then stocked in that habitat which has either been degraded by introducing exotic species or converted into lentic water bodies which are not favorable environment of this species.

Publication during the Year:

1. J.R.Dhanze and Rani Dhanze, 2004.Technology for harnessing of runoff water for aquaculture in the hills. *National workshop on rational use of water resources for aquaculture*. Pp.48 – 54.
2. Rani Dhanze, J.R.Dhanze and Indu Sharma, 2004. Limnobiotic status of River Giri. *National symposium on management of aquatic resources for biodiversity maintenance and conservation*.Abstract no. **A-8** : 15.
3. Indu Sharma and J.R.Dhanze, 2004. Food and feeding habits of *Tor putitora* (Ham.) in Beas River system. *National symposium on management of aquatic resources for biodiversity maintenance and conservation*.Abstract no. **A-5** : 1.
4. R.Dhanze and J.R.Dhanze,2004. Fish diversity of Himachal Pradesh, In:S.Ayyapan, D.S.Malik, R.Dhanze and R.S.Chauhan (eds). Fish diversity in protected habitats. Pp.39-60. NATCON Publ. No.8
5. Dhanze J.R, and R.Dhanze,2004. Role of protected habitat in the conservation of indigenous germplasm- A case study In:S.Ayyapan, D.S.Malik, R.Dhanze and R.S.Chauhan (eds). Fish diversity in protected habitats. Pp.129-140. NATCON Publ. No.8

6. Dhanze, R., Rohila,S.and J.R.Dhanze,2004. Fish faunal resources in snow fed river Giri. In:S.Ayyapan, D.S.Malik, R.Dhanze and R.S.Chauhan (eds). Fish diversity in protected habitats. Pp.205-218. NATCON Publ. No.8

Seminar and symposia attended:

1. Dr. J.R. Dhanze, Prof. and Head attended a national symposia on "National symposium on management of aquatic resources for biodiversity maintenance and conservation" organized by Department of Zoology, JNV University, Jodhpur and Nature Conservators (India), Muzaffarnagar at Jodhpur from 2-4th February, 2004 and delivered a guest lecture on "Harvesting and management of aquatic resources for aquaculture in the hills".
2. Dr. (Mrs) Rani Dhanze, Scientist also attended the above mentioned symposia
   and presented a paper entitled "Limnobiotic status of River Giri".
3. Dr. J.R. Dhanze, Prof. and Head attended a national symposia on " National workshop on rational use of water resources for aquaculture" organized by CCS Haryana Agricultural University, Hisar from 18-19March, 2004 and presented a paper entitled "Technology for harnessing of runoff water for aquaculture in the hills" .
4. Dr.J.R.Dhanze,Prof. & Head, participated in the workshop on "Prospects and status of trout farming in India" organised by Directorate of Fisheries at Shimla from 24th to 25th May,2004.

Summer school and training Organized

Department has organized a short training course on "Recent advances in cold water aquaculture" from 22nd September to 1st October 2003, sponsored by ICAR, New Delhi. A total of 25 participants from different part of the country participated in this programme. A total of 17 lectures were delivered by the faculty of the Department, besides, the three invited lectures by Dr. K.K.Vass, Director, NRCCF(ICAR), Bheemtal, Dr. Kuldeep Kumar, Advisor-cum-Chief Executive Officer, Directorate of Fisheries and Dr. B.D.Sharma, Deputy Director Fisheries, Trout Farm Patlikuhl, Kullu.

Summer school and training Attended

Dr. (Mrs) Rani Dhanze, Scientist attended a short course training on " Program/Project priority Setting, Strategic planning & Management and Computer Application" held at Centre for Human Resource Development in Mountain Agriculture, CSKHP Agricultural University, Palampur (HP) from 20th to 31st December, 2003.

Guest Lectures delivered:

Dr. (Mrs) Rani Dhanze, Scientist delivered a lecture on "Hill Fish farming" to the SSB trainees and held practical on 11th July,2003. She also delivered two lectures on " Processing and value addition of fish and fish products and Fish farming techniques for hills" and Dr. R.K.Bali (Sr. Tech.) delivered on " Harnessing of runoff water for aquaculture and Cost of production and marketing in fisheries in HP" to the farmers at Bilaspur on 22nd October,2003 organized by SAMETI and ATMA, Shimla. An invited lecture on "Diversity in fish faun in H.P." has also been delivered by Dr. (Mrs.) Rani Dhanze, Scientist in IHBT, CSIR, Palampur on 4th November 2003. Twelve lectures on different aspects of fish faming technology in the hills along with the practical demonstration were delivered by the resource persons of this department from 25 to 27th November 2003 organized by the Department of Extension Education , CSKHPKV, Palmpur for the farmers of Kandi Project Bhadroya (Hagval).

LIVESTOCK FARM

The Livestock Farm came into existence as an independent service unit during the year 1997. At present, it is the single largest unit of COVAS. The farm is entrusted with the maintenance of a large dairy herd along with other livestock species like goats, horses etc. for meeting the teaching, research and extension education requirements of the University. Currently, two state-funded schemes viz. VNP-006-45 (Establishment of Livestock Farm) and VPL-004-45 (Strengthening of facilities for Livestock Farm) are operational under the livestock farm. Besides, the operational expenditure of the dairy herd is met from a revolving fund scheme started during May, 2002. The teaching faculty posted at the farm is actively engaged in teaching, research and extension education activities in the respective disciplines. The salient achievements of the farm during this year (2003-04) are summarized as below:

Progress of the livestock farm

Performance of dairy herd

The total herd strength during the beginning of the period was 209 animals. Subsequently, 70 (33 male + 37 female) animals were added to the herd on account of births/calving during the period. A total of 64 animals (31 male + 33 Female) left the herd either because of mortality (50 animals) or transfer to other departments (14 animals). The herd strength marginally increased to 215 animals by the end of the year. The herd strength had to be maintained at the level of previous year due to financial constraints. The comparative performance for production indicators of the Livestock Farm is as under:

Parameter	**Performance during the year**	
	2002– 03	**2003-04**
No. of cows in milk	92	96
Total milk production (lit)	2,35,389.2	2,43,419.55
Wet Average (lit/cow/day)	7.01	6.91
Herd Average (lit/cow/day)	5.29	5.68

The total milk production during the period under report was slightly higher (3.4%) than the preceding year due to more number of cows in milk, but the wet average (milk yield/milking cow/day) marginally declined. The herd average, based on all the cows, however was higher (5.68 lit/cow/day) because more number of cows in the herd (82.30%) remained in milk due to better reproductive efficiency

Performance of economic traits of dairy herd

The departmental research at the farm is focused at the evaluation of Jersey germplasm and its crosses with the Red –Sindhi breed. The performance under farm conditions of these breeds is being recorded on various production and reproduction parameters under the local climatic conditions. Continuous efforts were made to optimize the performance of dairy herd for various economic traits by improved management, feeding and disease control measures. The Jersey X Red Sindhi crossbreds have performed consistently better than the purebred Jersey cows both for the milk production and reproduction parameters at the farm. The reproductive parameters have improved in crossbred cows over the previous years in spite of low first insemination conception rate (35.53%). The first insemination as well as first three insemination conception rates was higher in Jersey (51.11% and 80.00%) cows than in crossbred (35.53% and 72.38%)

cows with overall improvement over the previous year. There was significant improvement in the age at first calving, both in Jersey and crossbred heifers at the farm by augmenting the heat – detection, feeding and management and conception rate. The mortality incidence in the adult stock however increased over the preceding year in all the genetic groups.

Fodder production and land development

The area under fodder cultivation was 54.8 hac. and 50.2 hac. during the kharif and rabi seasons under the report. The fodder production /hac. during the kharif season (136.23 qts/ha) was comparatively better than the last year but poorer (58.97 qts/hac.) during the rabi season under report. The total green fodder availability from different sources was slightly lower this year (11391.93 qtls) than the preceding year (11674.84 qtls) due to lesser fodder production in rabi season. Higher quantities of grasses and hay were harvested during the year which improved the dry fodder availability. Lesser land area could be put under cultivation during both the seasons as some of the area was put under the perennial grasses cultivation for grazing purposes.

The pasture land development work was taken up in collaboration with the forage group and large bushes – infested area was cleared of and plantation of improved pasture grasses was carried on for grazing of livestock. The improved grasses like Hybrid Napier, Setaria, inter -cultured with Clover and other legumes, was introduced since Feb-March, 2003 on grazing lands/pastures after clearing the area (approx 40 ha) from bushes, weeds etc. This area was developed for grazing and the non producing stock was taken for regular grazing. Furthermore; 900.70 qt maize silage was prepared during the Kharif season to meet the green fodder requirements during the lean winter months.

Performance of Revolving fund scheme

The revolving fund scheme on "Maintenance of Livestock Farm" to meet the operational expenditure on maintenance of dairy herd was started during the financial year 2002-2003.The financial status of revolving fund scheme during the agricultural year 2003-04 is as below.

Particulars	**2002-03**	**2003-04**
Opening balance as on 1st July.	3,19,451.22	3,91,120.76
Credit during the period (Sale proceed + interest)	34,42,760.14	33,78,996.61
Debit during the period (Contingent expenditure)	33,71,091.00	31,21,329.00
Refund / Contribution to University	2,00,000.00	1,00,000.00

A sum of Rs. 1.0 lacs was contributed from the revolving fund scheme to the University during January 2004 in this year.

Teaching Activities

During the two semesters; 2+1 undergraduate and 2+1 post graduate teaching credit hours were offered by the scientific staff of the livestock farm at COVAS besides Ph.D research credits of 15 in COA. In addition, various UG practical were also conducted at the farm. Two postgraduate students of different departments of COVAS undertook their thesis research work at dairy farm. The faculty of LSF was allotted 1 P/G student as major advisor and was also associated with the advisory committees of five PG students of COA/ COVAS.

Research Activities

Apart from the departmental research at livestock farm, the faculty of the livestock farm is actively engaged in the basic and applied research at farm and in association with other departments of the College/ University.

Extension Activities

The farm faculty delivered 30 lectures and 5 practical demonstrations to the trainees of various training programs conducted by the university for the farmers, farm-women, unemployed youth etc. on dairying and related fields. Besides, on farm demonstrations of improved dairy husbandry practices were given to approx. 40 groups of visitors including farmers, trainees and others (1550 people) who visited the farm during the year.

Conference/ Symposium / Workshop/ Trainings attended by faculty:

Dr. A. S. Saini,

- Training courses organized by Regional Training Centre, Dharamshala.
- Monthly workshops of Sr. District Officers and Subject Matter Specialists, organized by the Directorate of Extension Education CSK HPKV, Palampur.
- Fourth meeting of the NATP site committee of CSK,HPKV, Palampur, organized by NATP, PMU, CSK, HPKV, Palampur on Feb.25-26,2004.
- 4 National Symposium on "Food and Nutritional Security: Technological interventions and Genetic options", held at CSKHPKV, Palampur, Sept.18-19.2003, vol.2:205.

Dr. Y. P. Thakur

- All India Dairy Husb. Officers Workshop held at N.D.R.I., Karnal on Sept., 5-6 , 03.
- Training workshop on "Personality development and student counseling" organized at College of Agriculture, CSKHPKV, Palampur on Oct.8-16,03 at Palampur..
- National Symposium on "Livestock biodiversity vis-à-vis resource exploitation: An Introspection" held at NBAGR, Karnal, Haryana on Feb, 11-12, 2004.
- National Symposium on "Conservation and propagation of livestock and poultry" and the annual conference of Indian Society of Animal Genetics and Breeding held on February, 26-28, 2004 at G.B, Pant University of Agri. & Tech. Pantnagar, Uttranchal.
- Fourth meeting of the NATP site committee of CSK,HPKV, Palampur, organized by NATP, PMU, CSK, HPKV, Palampur on Feb.25-26,2004.
- XXII Conference of Indian Poultry Science Association and the National Symposium on "Strategies for promoting commercial poultry farming in the hills" held at COVAS, HPKV, and Palampur (H.P.) on April, 7-9, 2004.

PUBLICATIONS

Papers Published:

1) Saini, A.S., Sharma, K.D., Thakur, D.R. and Singh Harpreet (2003). "Performance of Agriculture during the Regime of Liberalisation: Evidences from Himachal Pradesh". *Indian Journal of Agricultural Economics, 58(3):393-94.*

2) Thakur J.S. and Thakur Y.P.(2001). Lactation induction in heifer and non-pregnant cows. Himachal J. Agricultural Research. 27(1&2):111-114.

3) Katoch, Ajay; Katoch, S.; Gupta, K. Dogra, P.K.; Sharma, S.K. and Thakur, Y.P. (2003).Mineral and biochemical profiles in Spiti horses**.** Centaur 20 (3): 48-49.

4) Katoch, S.; Dogra, P. K.; Thakur, Y.P. and Gupta, K. (2004): Phenotypic Characterization of Spiti horses in its breeding tract: Body measurements. Centaur, 20 (3): 45-47.

Papers presented in conferences/symposia etc.:

1) Sharma, K.D., Saini, A.S. and Thakur, D.R.(2003), "Scenario of food and nutritional security in Himachal Pradesh: An Empirical Analysis". Paper presented at the National Symposium on Food and Nutritional Security: Technological interventions and Genetic options, held at CSKHPKV, Palampur, Sept.18-19.2003, vol.2:205.

2) Sharma, K.D., Thakur, D.R. and Saini, A.S. (2004), "Rationalizing pricing and marketing system for vegetable crops in Himachal Pradesh". Paper presented in Seminar on Agriculture and Horticulture Marketing Development and Organized by Himachal Mandi Board in collaboration with ISAM at Shimla, May 25-26,2004.

3) Thakur D.R., Saini, A.S. and Sharma, K.D.(2004), "Marketing of Cut - flowers in Mountains: Dimensions, Linkages and Strategies". Paper Presented in Seminar on Agriculture and Horticulture Marketing Development and Management Organised by *Himachal Mandi Board in collaboration with ISAM at Shimla, May 25-26, 2004*.

4) Thakur, Y P, Girish Sharma and Gupta, K (2004): Feeding Practices and Forage resources for Chegu goat production in its native tract in cold desert region of Himachal Pradesh. In proceedings of the National Seminar on "Opportunities and Challenges in Nutrition and feeding management of sheep, goats and rabbits for Sustainable Production" held on February, 10 -12, 2004 at CSWRI, Avikanagar. pp 332; Ab. 43.

5) Gupta, K, Alka Prasad and Thakur, Y.P. (2004): Study on morphological characteristics of Gaddi sheep breed in Himachal Pradesh. In proceedings of the National Seminar on "Opportunities and Challenges in Nutrition and feeding management of sheep, goats and rabbits for Sustainable Production" held on February, 10 -12, 2004 at CSWRI, Avikanagar. pp 374; Ab. 109.

6) Thakur, Y P, Katoch, S and Gupta, K (2004): Characteristics of Chegu breed of goats in the breeding tract in Himachal Pradesh. Paper presented in the National Symposium on "Conservation and propagation of livestock and poultry" and the Annual conference of the Indian Society of Animal Genetics and breeding held on February, 26 -28, 2004 at G B Pant Univ. of Agric. & Tech., Pantnagar, Uttaranchal. In proceedings, pp 11; Ab 19.

7) Katoch, S Dogra, P K, Thakur, Y P and Gupta, K (2004). Characterization of the Spiti horse in its breeding tract Reproductive parameters Paper presented in the National Symposium on "Conservation and propagation of livestock and poultry " and the Annual conference of the Indian Society of Animal Genetics and breeding held on February , 26 -28,2004 at G B Pant Univ. of Agric. & Tech., Pantnagar, Uttaranchal. In proceedings, pp 31; Ab. 49.

8) Thakur, Y P, Katoch, S Dogra, P K, and Gupta, K (2004): Livestock diversity in cold desert region of Himachal Pradesh: A study of Lahaul & Spiti district. Paper presented in the National Symposium on "Livestock biodiversity vis-à-vis resource exploitation: An introspection" held at NBAGR, Karnal, Haryana on Feb, 11-12,2004. In proceedings, pp 31; Ab. AGR 101.

9) Katoch, S , Dogra, P K Thakur, Y P , and Gupta, K (2004) : Phenotypic characterization of Spiti horse in its breeding tract : Coat colour patterns and body markings. Paper presented in the National Symposium on "Livestock biodiversity vis-à-vis resource exploitation: An introspection" held at NBAGR, Karnal, Haryana on Feb, 11-12,2004. In proceedings, pp 31; Ab. AGR 048.

10) Gupta, K , Kailla O P, Thakur, Y P and Katoch, S (2004) : Growth pattern studies of Gaddi sheep in cold arid zone of Himachal Pradesh. Paper presented in the National Symposium on “Livestock biodiversity vis-à-vis resource exploitation: An introspection” held at NBAGR, Karnal, Haryana on Feb, 11-12, 2004. In proceedings, pp 31; Ab. AGR 126.

VETERINARY CLINIC

The clinic wing of this complex is a nodal referral hospital for the livestock, pets and wild animals of the state for treatment of obscure, undiagnosed and the diseases, which need, specialized approach. It also serves as a platform for imparting practical knowledge and improving of professional skill of UG and PG students mainly in the fields of Gynaecology, Medicine, Surgery, and Epidemiology, Pathology, Microbiology, Parasitology and Clinic Biochemistry to some extent. During this year a total number of 4706 cases mainly livestock followed by pets and wild animals were treated from teaching, extension, research and community development point of view. Facilities for the artificial insemination of 644 livestock was also provided.

Clinical Camps:-

A total number of 36 camps in Lahaul and Spiti, Sirmour, Chamba, Mandi, Kullu and Kangra districts were organized and 1178 cases treated. Apart from treatment and on the spot diagnosis of the diseases of livestock, lectures on package of practice on Animal Husbandry were delivered and solution to the specific problems of the livestock owners were also given. Facilities to the Blue Cross Society of Himachal Pradesh were also provided to organize community welfare camps.

Clinical Samples Examination:-

The clinical laboratory attached to the clinic is adequately equipped for diagnosing various diseases by way of examining the samples of blood, urine, faeces, milk and skin scrappings. Examination of 1913 samples helped in diagnosing the diseases like mastitis, amphistomiasis, strongylosis, babesiosis, theleriosis, scabies, colic, respiratory distress syndrome, intestinal obstruction and traumatic reticulo-peritonits in addition to the diseases of common occurrence.

Ambulatory Clinical Practice:-

Practical field trainings to the 4^{th} and 5^{th} professional students were given by taking them to various field locations for gaining experience and confidence for attending the livestock of the farmers.

Care for the Wildlife:-

Captive and free ranging wildlife like Lion, Leopard, Black Bear, Goral, Monkey, Parrot, Pigeon, Peacock and Demoselly crane were treated, rehabilitated and/or released. Communities were relieved of the leopard menace by capturing them. In the first ever operation, monkeys were captured without hurting the religious sentiments of people by using special technique for diagnosing their disease at Jakhoo Temple at Shimla.

Emergency and Consultancy Services:-

Emergency Service to the livestock and pet owners was provided round the clock including all holidays. Consultancy service on personal visit or on telephone was provided to 2259 cases. Farmers of IRDA projects operating in various districts of state have been benefited through telephonic consultancy.

Internship Programme:-

A unique internship programme for 21 interns of 5th professional in five batches is being carried out at Kullu, Mandi, Shimla and Una districts in additions to various departments of the college. Their performance is being monitored regularly at these locations.

Income Generation:-

A sum of Rs.49,584/- has been generated under revolving fund scheme started during the year 2001-02, through user, consultancy and service charges thereby increasing the total amount of Rs.1,20,367/-. Proposals to further boost the income are underway in order to make this unit a self sufficient one

ICAR –JRF EXAMINATION

The Final year students of the college excelled in the All India Junior Research Fellowship conducted by the Indian Council of Agricultural Research- New Delhi for the year 2003-2004. Following positions were bagged by the final year students of the college who will get admission for Post graduation in the various institutes of the country along with a monthly stipend of Rs. 5000.

ANIMAL SCIENCES

ALL INDIA RANK	NAME
6	Neeraj Kumar Chadha
14	Deep Kumar Chadha
18	Chiranjee Lal Chauhan
30	Navneet Sharma
39	Rajesh Kumar Janga
65	Manav Guleria
72	Anshul Chandel
90	Rajesh Kumar Sharma

VETERINARY SCIENCE

5	Ram Parkash Kamal
35	Kailash Thakur

AWARDS AND HONOUR

1	Dr. J.R.Dhanze,	Fishery	Nature Conservator's KAUTYLAYA Gold Medal	Significant contribution in the field of Cold water Aquaculture.
2	Dr. (Mrs) Rani Dhanze	Fishery	Fellow Nature Conservators	Significant contribution in the field of Cold water Aquaculture
3	Dr. Madhumeet Singh	Veterinary. Gynecology & Obstetrics	Vice Chancellor's appreciation award	For doing commendable work in Clinical camps in remote areas of H.P
4	Dr R K Asrani	Veterinary. Pathology	Dr. C.M. Singh Award 2002	XX Annual Conference of IAVP held at Jabalpur
5	Dr.R.K.Asrani, Dr.V.K. Gupta and Dr.S.P. Singh	Veterinary. Pathology	Savitree Jibachch Sinha Award	Best Poster Presentation

6	Dr. A.C. Varshney and Dr. M.S. Kanwar	Veterinary Surgery & Radiology	Shri Ram Lal Aggarwal National award	For promotion of herbal medicines
7	Dr. AC Varshney	Veterinary Surgery & Radiology	Vice Chancellor's appreciation award (2003)	For bringing laurels to University as chosen fellow of ISVS and IAAVR and for National award.
8	Dr. S.K. Sharma, Dr. Adarsh Kumar, Dr. S.P.Tyagi	Veterinary Surgery & Radiology	Vice Chancellor's Appreciation award,	For online lectures on Univ. Website
9	Dr. M.S. Kanwar	Veterinary Surgery & Radiology	Vice Chancellor's Appreciation award, CSKHPKV, Palampur, 2004	For doing commendable work in organizing Clinical camps in remote areas of Distt. Sirmour
10	Dr. A.C. Varshney	Veterinary Surgery & Radiology	Fellow of Indian Society for Veterinary Surgery (Awarded 2003).	For significant contribution the field of Vety. Surgery and Radiology
11	Dr.S.K. Sharma and Dr. Adarsh Kumar	Veterinary Surgery & Radiology	Gold medal	Best paper in Anesthesiology session Awarded by ISVS, 2003
12	Dr.R.K.Mandial	Veterinary Clinical Medicine, Ethics & Jurisprudence	Vice-Chancellor Appreciation Award-2003	Organizing veterinary clinical camps in remote villages of the state.
13	Dr. Des Raj	Veterinary Clinical Medicine, Ethics & Jurisprudence	Commendation Certificate – 2003	From Director, Summer School, Indian Veterinary Research Institute, Izatnagar
14	Dr. R.S.Kishtwaria	Veterinary Clinics	Executive member of World Association of Wildlife Veterinarian.	Nominated Executive member of World Association of Wildlife Veterinarian.
15	Dr.D.N.Sharma	Veterinary Anatomy	Awarded Emeritus Scientist	By the Indian Council of Agricultural Research
16	Dr.Meena Kumari	Animal Nutrition	Vice Chancellor's appreciation award	Excellent performance in training (poultry farming).
17	Dr.A.S.Saini	Livestock Farm	Vice Chancellor's appreciation award	Excellent Contribution in Diary Farm Improvement
18	Dr.B.Paul	Veterinary Medicine, Ethics & Jurisprudence	Besr Poster Award	11th Annual conference of IAAVR

VISITS ABROAD

1	Dr Kamlesh Gupta	Department Of Animal Breeding And Genetics	Vienna (Austria)	International Conference on Gene bases technology for Improvement and production of Livestock in developing countries
2	Dr. S.K. Khurana	Veterinary public health	Istanbul(Turkey)	XXII World's Poultry Congress and Exhibition
3	Dr. A.C. Varshney	Veterinary Surgery & Radiology	Berlin, Germany	1st Congress of the International Seabuckthorn Association
4	Dr. M.S. Kanwar	Veterinary Surgery & Radiology	Knoxville (USA)	8th World congress of veterinary anesthesia

VISIT OF DIGNITORIES

1	His Excellency Justice..V.S Kokje, Governor of H.P	30th July, 2003	Visit of College of Veterinary & Animal sciences
2	Dr. A.D. Diwan, ADG(Fishery), ICAR, New Delhi	22nd September, 2003.	To inaugurate the short summer training course programme organised by department of Fishery
3	Dr. K. K. Vass, Director, NRCC (ICAR), Bhimtal, Uttaranchal	22nd & 23 September, 2003.	To deliver lecture in the short summer training course programme organised by department of Fishery
4	Dr. Kuldip Kumar, Advisor Fishery Government of Himachal Pradesh	27th September 2003	To deliver lecture in the short summer training course programme organised by department of Fishery
5	Hon'ble Minister of Animal husbandry and Fisheries (HP) Shri Harsh Mahajan	10th October 2003	Oath taking ceremony of the passed out graduates of College of Veterinary & Animal sciences
6	Mr. Kaundal Director State Fisheries (HP)	10th October 2003	Department of Fisheries
7	The Ambassador of Republic of Eritrea	22.05.04	Visit of College of Veterinary & Animal sciences
8	Dr. V.K.Taneja, DDG (Animal sciences, ICAR-New Delhi)	8 April, 2004	Chief Guest, National Conference of IPSA
9	Dr Arun Verma, ADG (Animal sciences) ICAR, New Delhi	8 April, 2004	National Conference of IPSA

STUDENT ACTIVITIES

The students of the College won the **Overall Vice-Chancellor Trophy** in sports activities of the University for the year 2003-04.

Apart from this the following students won the prizes in the various sports events for the year under report

S.NO	STUDENT	EVENT	POSITION
1	Munish Julka	100 mtr	IInd
2	Munish Julka	200 mtr	IInd
3	Yajuvinder Sharma	400 mtr	IInd
4	Vikas Saklani	100 mtr	IInd
5	Vipin Sharma	1500 mtr	IIIrd
6	Akshya Prakash	5000 mtr	Ist
7	Akshya Prakash	10000 mtr	Ist
8	Vipin Sharma	10000 mtr	IInd
9	Sushil Sharma	10000 mtr	IIIrd
10	Amit, Vikas, Nikhil & Manjor	4x400	IInd
11	Nikhil	High Jump	IInd
12	Manoj Bhargav	High Jump	IInd
13	Nikhil	Hop Step jump	IInd
14	Vishavdeep Rathor	Hop Step jump	IIIrd
15	Pradeep	Long Jump	IInd
16	Vikas Ranta	Shot Put	Ist
17	Amit Rajta	Shot Put	IInd
18	Vikas Saklani	Shot Put	IIIrd
19	Vikas Saklani	DiscussThrow	Ist
20	Amit Rajta	DiscussThrow	IInd
21	Prashant Mandavya	DiscussThrow	IIIrd
22	Nishant Verma	HammerThrow	Ist
23	Amit Rajta	HammerThrow	IInd
24	Vikas Saklani	HammerThrow	IIIrd
Women Athletic Meet Achievements			
25	Gazala	100 mtr	IInd
26	Rita Kaushal	200 mtr	Ist
27	Gazala	200 mtr	IInd
28	Gazala	400 mtr	Ist
29	Gazala, Rita, Pooja Kanwar & Shivani	4x100	IInd
30	Nishtara	Long Jump	Ist
31	Pooja Kanwar	Long Jump	IInd
32	Rita	Shot Put	IInd
33	Deepti Pathania	Shot Put	IIIrd
34	Nishtra	Discuss Throw	Ist
35	Pooja Kanwar	Discuss Throw	IInd
36	Rita Kaushal	Discuss Throw	IInd
37	Deepti Pathania	Javelin Throw	Ist
38	Pooja Rathor	Javelin Throw	IInd
39	Shivani Thakur	Javelin Throw	IInd
40	Rita & Gazala	Best Athlete	
41	Trophies	Volley Ball(Men)	Runners up
42	Narender, Saurabh Sharma Samrat	NCC	B Certificate

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Editors
Dr. R.C.Katoch
(Dean, COVAS)

&

Dr. Shivani Katoch
(Asistant Professor Veterinary & Animal Husbandry Extension)