



Reference Manual for Primary Animal Husbandry Workers



Animal Health & Production

Volume: I



**Organized By: Directorate of Extension Education,
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FOREWORD

I have immense pleasure to present the REFERENCE MANUAL FOR PRIMARY ANIMAL HUSBANDRY WORKERS. This compendium is the outcome of the series of Training Lectures and Practical Instruction notes delivered by the scientists and experts from the University. This is for the first time that a training of this sort has been organized by the University.

The organization of this unique 3 month long training was sponsored by the Mid Himalayan Watershed Development Project, Dharamshala, Distt. Kangra. It was a big venture which could fructify with the valuable scientific inputs by the faculty of the College of Veterinary and Animal Sciences and also by faculty members from a few other related departments. Veterinary and Animal Sciences are growing very fast nowadays. Our increasing dependence on foods of animal origin is paving the way for the LIVESTOCK REVOLUTION 2020. To achieve those targets and to ensure our higher share in the growing world market of foods of animal origin, we have to ensure our livestock producers, a minimal basic access to the relevant information. To an extent, the Primary Animal Husbandry Workers can possibly fill up this information gap, where immediate access to technical manpower is not available. Having been exposed to the various aspects of basic animal health, production and marketing, these trainees can provide useful links.

The broad outline of the training was conceived and prepared by Dr. J. S. Thakur, Senior Extension Specialist Animal Sciences, (now retired). It was through his efforts and perseverance that the training could take off in the present form. After his retirement, Dr. Alok Sharma, Professor & Head, Deptt. of Vety. & AH Extension Education took over the reins and steered the Training to its completion. Training is, in fact, a total team work. Dr. S. Katoch and Dr. Devesh Thakur of the Department of Vety. Extension have provided valuable and much-needed inputs at all times.

The In-Charges of KVKs at Bajoura (Kullu), Dhaulakuan (Sirmour) and Bara (Hamirpur) have effectively contributed towards organization of the Work Experience component of the Training.

I place on record my heartiest appreciation for each of the scientists and experts who have contributed for the training.

Finally, Director, Mid Himalayan Watershed Development Project, Dharamshala and his team deserves all appreciation for their fund-support.

(Dr. B. C. Sood)

Director Extension Education

ACKNOWLEDGEMENT

Organizing a 3 month Training of Primary Animal Health Workers was a unique experience for myself and my team. A few new ideas were tried and many of the practices in vogue in the routine training were modified to suit the needs of the trainees. Within a short time, a training capsule was devised, infusing a lot of audio-visual based teaching approach. On the whole, this period of training (Theory teaching, practical orientation as well as the work experience component outside the CSK HPKV, Palampur, at various *Krishi Vigyan Kendras*) was a period of vigorous and dynamic planning, and execution for myself and two of my colleagues in the Department, namely, Dr. S. Katoch and Dr. Devesh Thakur. I am thankful to them beyond words. Dr. Katoch was instrumental in designing and shaping the ***Reference Manual for Primary Animal Husbandry Workers***, while Dr. Devesh contributed towards editing.

At the very outset, I wish to put on record, my most pleasant maiden experience of working under the guidance of Dr. B. C. Sood, Director Extension Education. I used to call him at odd hours for help, visit him for solution for a host of emergent issues and problems. He would always solve my constraints 'there and then'. It has been a wonderful experience for me to work under his guidance.

Right from the start, till the end, it was Dr. J.S. Thakur, Sr. Extension Specialist who has been my help and guide to conduct such training. I have depended heavily on his experience. The very idea and concept of the Training was conceived and planned by him.

I wish to thank all scientists/ faculty members from the various departments of the COVAS, from other departments, from KVKs at Bajoura, Dhaulakuan and Bara, NDRI Karnal, Manager Milk Plant Jalandhar, Dr. Sushant Mittal, who have contributed their expertise for teaching and during work experience.

The office staff of the Directorate of Extension Education (specially Mr. Mohinder) and my own departmental staff, namely Mr. Pyare Lal, Mr. Anil Kumar, Mr. Hari Singh deserve my heartiest thanks for their valuable help at the times of need. All your efforts have helped smooth completion of the training and towards bringing out the Reference Manual for Trainees, in time.

Dr. Alok Sharma

Training Co-ordinator

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Chain Game : Practical exercise to explore the advantages of vaccinations in preventing and controlling contagious diseases in animals By *Devesh Thakur, S.Katoch &*

Alok K. Sharma Deptt. Of Vety & AH Ext Edu, DGCN COVAS, CSK HPKV, Palampur.

Government of India annually spends millions of rupees in providing preventive health coverage to the economically important diseases e.g.FMD/HS/BQ present in India including Himachal Pradesh. Yet, it suffers losses in millions of rupees due to various diseases outbreaks. Currently most commonly employed preventive strategy to control these diseases is animal vaccination. However, often non adoption of vaccination occurs due to lack of awareness and the indifferent attitude of the farmers/stakeholders to the practice of vaccination .By employing suitable extension techniques farmers can be made aware and desirable changes in their attitude towards vaccination can be brought. The “**chain game**” is one such practical exercise which can be performed by the ground level extension workers so that the mass awareness and adoption of vaccination by the farmers can be made.

Method : Round 1

1. One person is the ‘den’ infected animal with germs ,others are healthy animals .
2. If the den catches a person (healthy animal) that person too falls sick and becomes a new den. The healthy animals have to try and escape from the dens.
3. Play the game for about two three minutes.

Stop the game when everyone becomes a den, which will be quite soon. Count the number of dens at the end of the game.

Round 2

4. Play the game again, but this time let one person be the doctor who is vaccinating animals.
5. When the game starts, the den tries to infect the others while the doctor injects(vaccinates) the players. The vaccinated player stands still ,to indicate he/she is immune and cannot be infected i.e. touched by the den.
6. Play the game for a while and count the number of dens.

Discussion:

- 1.What happened in round 1 when there was only one den ?
- 2.What happened in round 2 when there was a den and a doctor
3. Why did the disease spread so rapidly in round 1
4. What lessons can we draw from this?

Summarization

Round 1: The infected animal(den) caught a healthy animal, causing it to become sick and importantly becomes a new link in the chain of diseases. Thus more and more players become infected and each one become a link in spreading the diseases. At the end of the game there were very few healthy players left. This was because each new infected animal apart from becoming infected itself also acquired the power or germs to infect others

Round 2: In the second round ,the doctor vaccinated animals so that they became immune to the chain (infection).The disease was limited to few animals in the herd, and thus controlled. All the other animals remained healthy. The infected animals either recover or die, causing the diseases to die out with them.

Lesson learnt : Vaccination is very important not only to prevent the diseases but also to control the diseases and eradicate it from the entire herd as well. The greater the number of vaccinated animals, the easier is to eradicate a disease.

Lecture-2

Practical exercise for mapping the livestock resources of your village *By Devesh Thakur, S.Katoch and Alok K. Sharma Deptt. Of Vety & AH Ext Edu, DGCN COVAS, CSK HPKV, Palampur.*

Currently information network to document the village livestock resources in Himachal Pradesh are lacking. Further formal system of feedback from the farmers is missing by which research/technology/inputs delivered can be tested .By such type of exercises as mentioned below valuable data collection can be generated with the help of the primary health workers who can work under veterinarians /extension officers for collecting such type of data and participation.



Exercise: To create a resource map of the village today and thirty years ago which includes the following :

1. Households of livestock rearers.
2. Animal breeds and species reared in the village
3. Agricultural land –crops grown
4. Grazing resources of the village
5. Grazing routes of the animals
6. Watering resources
7. Distance of nearest veterinary clinic , local healer, market ,etc. From village (other actors)

Materials: Coloured rangoli / chalk/sketch pens, chart paper , markers.

Method:

1. Get the group to collectively map out the village and surrounding areas including fields, hills, rivers, forests etc. Different parts are to be indicated with different colours. Use of mud, twigs and local materials to model hills/forests.
2. Each livestock owner should indicate his/her house on the map. Confirm whether all the owners of the village are present in the ongoing interaction.
3. The group could indicate different categories of livestock holders (e.g. Buffalo rearer/poultry rearer/migratory/sedentary etc) by different colours
4. The typical grazing routes of the animals and areas grazed by different species are shown with arrow routes

The same exercise should be repeated for a map of 30 years ago

Discussion: The two maps would be used to facilitate a discussion about thirty years ago and now.

- What changes have occurred? Differences in number of different livestock holders: Are there more now, or less? Are there people from new communities? Why has the change occurred? Why have people joined /left the profession?
- Which breed /species of animals have declined /increased?
- Differences in grazing areas? Have the community experienced any major livestock disease occurrence/any major fodder crisis?
- Seasonal variations? What is the view of livestock farmers about the future?
- Change in watering resources and impact on different livestock species
- Marketing avenues and problems
- Diseases constraints

Outcome: The above exercise would help in inventorisation of village livestock resources so that optimum utilisation of resources can be done and to get help of external resources when and where required.

Lecture-3

Identification of key communicator *By S.Katoch, Devesh Thakur, and Alok K. Sharma Deptt. Of Vety & AH Ext Edu, DGCN COVAS, CSK HPKV, Palampur.*

Key communicators are part of a social group who are sought more for information and activities on general and specific purpose. They are persons who are more important than others in a community for information. E.H. Roger defined key communicator as a type of opinion leader to whom society looks for information about new ideas. Essentially, a key communicator network is a network of opinion leaders who establish solid two-way communication between an organization and public. These opinion leaders talk to a lot of other people, and their audiences tend to listen to what they have to say. They agree to correct misinformation and to disseminate accurate information. They also keep in touch with officials and immediately report misperceptions and inaccuracies before they are

widely spread. Studies have found that mass communication generally does not change minds but only reinforces existing positions, thus activating the opposition as well as supporters. One-on-one communications, on the other hand, is quiet and speaks directly to the target audiences. The aim of one-on-one communications, through a network of key communicators, is to build support for a new idea or technology. Patrick Jackson, a well-known public relations practitioner and editor of *PR Reporter*, says opinion leaders are critical for a simple, but seldom expressed, reason. "Publics, or groups, don't act *en masse*. They follow leaders who are pacesetters. These persons jump-start behavior within the group. Left to their own devices, publics may choose to be led in any direction. The choice is whether or not to influence this direction."

Key communicators are adults who talk to and are believed by a large number of people in the community. They may or may not be in positions of authority or officially recognized leaders. Key communicators are everywhere, but even though they are highly influential, they may not be highly visible. Their distinguishing characteristics are that they are respected by their peers and other people trust their opinions

Methods of identification:-

Direct method:- Here the key communicator may be picked from any office of an organization and is the one who is easy to locate. However it is essential to win the confidence of farmers for successful implementation of new programme in the society. These leaders are comparatively more resourceful and have contacts with different developmental agencies.



Indirect method:- Sociometric method:- Here all individuals in a social group or village are asked to name person in order of preference whom they contact for any specific problem or advice. Later on a matrix table is prepared with names and choice. The individual with highest choice ranking are taken as key communicators.

Rating method:- Here some members of particular group are selected as judges and asked to nominate the person giving advice and information on a particular aspect. The names thus obtained are considered on maximum frequency nomination basis.

Self designation method:- Here each person is asked a series of questions to determine the degree to which he or she perceives himself or herself to be a communicator or opinion leader for a particular purpose. The success or accuracy of this method however depends on opinion of self designated option.

Sociometric method for identification:- It is the most approved method which involves a set of questions pertaining to a specific problem asked to different individuals in choice i.e. 1st and 2nd and 3rd where they would consult for seeking advice on a particular problem. After getting response, the information is tabulated in the form of a matrix table. In order to make the relation more clear, the above data is presented in the form of a graph called sociograph. Persons getting maximum number of choices may be treated as key communicator.

Once the key communicators are identified, it is critical to communicate with them regularly on a personal, one-to-one basis. Their phone calls to officials should be returned immediately, and their requests for information answered promptly. If they are expected to share news, they must have that information in a timely and understandable fashion.

Procedure: Use sociometric method for identifying the key communicator. This method involves a set of questions pertaining to a specific problem to be asked from different individuals

1. Begin by contacting members of village, and others in the community that represent various panchayat institutions, clubs, civic associations, occupations and so on. Be sure to include all socioeconomic levels.
2. Explain that you are trying to compile a list of people in the community who are not necessarily visible leaders, but who are respected and listened to and/or who are in a position to interact with a number and variety of other people.
3. Frame questions: (to ask individuals) the name of any persons in order of their preference i.e in order of 1st, 2nd or 3rd from within the social group or system where they would consult for seeking advice or for a particular purpose.
4. After getting response, tabulate the same in the form of a matrix table. The individuals are called as A, B, C... In order to make the relationship more clear, present the above data in the form of a diagram called sociogram.
5. The individual who gets the higher ranking or maximum number of choices may be treated as Key communicator. Similarly another person whose advice is often sought by group members can also be identified from the matrix table or socio gram.

Lecture-4

Preparation of Value added indigenous milk products *By B. G. Mane, Department of Livestock Products Technology, COVAS, CSKHPKV, Palampur.*

RABRI: It is the most favourite indigenous milk products. Rabri is a condensed and sweetened milk products obtained by heating whole milk at simmering temperature in **karahi** under open fire; the skin/clotted cream formed on milk is removed with the help of **karchi** in cooler part. When the milk is reduced in considerable amount then adds sugar, removed clotted cream, mixed homogenously and whole mass is again heated for some time. The final product obtained is delicious rabri. In this product during final mixing and heating other ingredients like elachi, kesar and dry fruits can be add for taste and better look.

Requirements: Whole cow/buffalo milk, sugar, karahi, open fire, karchi, and container for storage.

Preparation Procedure:

- Take a 5 litre of milk in a large shallow karahi.
- Start heating (85-90°C temperature) milk without boil so that the cream will start forming skin layer on milk.
- The remove the skin layer/clotted cream in pieces to cool corner of karahi or in separate container continuously.
- When milk quantity is reduced to 1/5th (1 litre) then add 250-300 gm sugar to the concentrated milk followed by addition of clotted cream layer.

- The above whole mass is mixed vigorously and heated for another brief period.

Benefits/Uses: The obtained products are used for direct consumption. The shelf life of milk is increased. This is one form of value addition to milk for higher economic return to farmers and processors. It adds the delicacies in foods.

SRIKHAND: Srikhand is a semi-soft, sweetish-sour, whole milk product obtained from curd/dahi. The curd/dahi is prepared from heated whole milk and addition of lactic culture/addition of previous days culture. The whey from dahi/curd is removed with the help of muslin cloth. After removing whey the remaining mass of curd/dahi is called as chakka. The chakka is a basic material for preparation of srikhand. The sugar is mixed with chakka for final preparation of srikhand. The srikhand is very popular milk products in western india, however, its popularity is increasing all over india especially in metros/cities.

Requirements: Whole cow/buffalo milk, sugar, containers for heating/setting dahi/whey, muslin cloth and storage container.

Preparation Procedure:

- Take a 5 litre of milk in a large container and heat till completely boil the milk.
- Put the previous days culture/curd/dahi (1-2%) into milk and kept without disturbing at least 15-16 hours in warm place.
- The ready curd/dahi is then placed in muslin cloth and hung on stand at least for 8-10 hours. The curd is squeezed and changed position during this process for easy removal of whey.
- The chakka is ready after removing whey from curd/dahi, which is base material for preparation of srikhand..
- The ground sugar 250-300 gm is added to chakka. Then the mixture is well kneaded into homogenous mass to produce the finished products.
- However, other colour and flavour ingredients can be also added. The whey can be utilized for preparation of whey drinks.

Benefits/Uses: The obtained products are used for direct consumption. The shelf life of milk is increased. This is one form of value addition to milk for higher economic return to farmers and processors. It adds the delicacies in foods. The srikhand is highly liked by children and provided along with chapatti.

Lecture-5

Processed poultry products and value addition *By B. G. Mane, Department of Livestock Products Technology, DGCN COVAS, CSKHPKV, Palampur.*

Poultry production has increased all over the world mainly because of economical price, health conscious diets, availability of variety products and successful scientific adaption of poultry enterprise. Indian situation is no exception to this and the past trends indicate substantial increase in poultry production. Organized development of poultry products industry is essential to provide quality products to a large variety of consumers and for facilitating better marketing and higher demand in order to support sustained growth in

poultry industry. In Indian situation the progress on all fronts is satisfactory except in the primary processing and processed poultry products production and marketing. Development of processed poultry products sector with appropriate marketing strategies is important for furthering poultry prospects. Processing aids to produce value added, variety and convenience meat products to meet life style requirements. Processing promotes employment, entrepreneur ventures, exports and competes imports. Value added products are further processed products with increasing convenience to consumer through decreasing preparation time; minimizing preparation steps.

Need and Prospects for processed poultry products: Production and marketing of processed poultry products have many functions and advantages in furthering poultry sector prospects. The demand for convenience meat based fast food is ever increasing due to rapid industrialization and urbanization, higher standards of living and increasing number of working women. The triple effects of population increase, income growth and urbanization will fuel the further growth in demand for poultry products. Value addition is an important avenue for efficient utilization of poultry resources with increased demand and higher returns. The growth of processed poultry products sector assures the farmers a regular off take of their produce at reasonable prices and provides a variety to the consumer. This is more so in poultry sector, when the market prices fall due to excess supply. Poultry could be processed and stored to be released into market at an appropriate time and farmer's returns could be protected to sustain his operations.

Primary steps in processing meat products

- **Deboning and Grinding of meat/fat:** Generally meat is deboned manually, semi-mechanically and mechanically. Then the meat is minced or grind in meat mincer or meat grinder once or twice using kidney plate of 8 mm and 4 mm size respectively. Meat and fat is grind separately and mix during the emulsion formation.
- **Blending and pre-blending with other ingredients:** For efficient use of tough meat from spent hens, many researchers have suggested their use in comminuted value added meat products, wherein meat and other components are minced to reduce their particle size and other ingredient are incorporated to improve the processing quality and palatability. The minced meats are generally pre-blended with various salts, but generally with common salt and polyphosphate.

Incorporation various meat and non meat ingredients:

A wide variety of non-meat products are being utilized as extenders, binders or fillers in comminuted meat products. These include soy flour, soy protein concentrate, soy isolate, textured soy proteins, nonfat dry milk, skim milk coprecipitates, yeast extract, dried yeast, flour made from durum wheat, rice, potato starch etc. They are added to meat formulations for one or more reasons viz., to improve the emulsifying capacity, emulsion stability, water binding potential, nutritive value, slicing characteristics etc. They also improve cooking yield, palatability and texture of the finished products from chicken meat. Even, recently some fruits and vegetables have gained the importance of functional foods, as they are a rich source of natural antioxidants, dietary fibers, essential minerals and vitamins. The egg and meat and meat by-products are also incorporated in the chicken meat products. The whole egg or egg white, egg white powders are used for value addition of chicken products. The mechanically deboned meats from frames are also added upto 10% in meat products, while

the by-products like heart, skin, gizzard, liver and fat are also incorporated in meat products with higher nutritional and sensory attributes.

Restructured poultry meat products

Restructuring is a processing technique used for developing convenience products with texture in between intact steak and comminuted products. It facilitates to develop more palatable products from spent hen meat. Some modern meat processing techniques such as blade tenderization, flaking and tumbling can be used to improve the product yield, binding, and texture and sensory attributes of the products. The purpose of producing restructured products is to effectively market less valuable carcasses (from spent and poor conformation) and carcass components. The basic processes include chunking, flaking, tearing, grinding, chopping, mixing, tumbling, emulsification, forming, freezing, tempering, pressing, slicing, cooking etc. tumbling, massaging and blade tenderization facilitate production of high quality restructured products. The products include steaks, cutlets, chop, roasts, rolls and hams.

Enrobed poultry meat products

Enrobing/coating of meat products with edible materials in the form of batter using flours, whole egg liquid and other additives is a method of value addition which enhances the acceptability of meat products. Enrobing imparts the product a crispy texture and increased the pleasure of eating with more desirable colour. Products will be juicier as natural juices are retained. Enrobing improves appearance, colour, crispiness, flavour, juiciness, nutritive value and microbiological profile of product. Enrobing, thus, provides processors with the greatest value addition opportunity at the lowest cost.

Emulsion based poultry meat products

This has a great advantage in Indian situation to produce a variety of products of consumer choice; a large variety of ingredients of consumer interest could be easily incorporated into the emulsion for the advantages of nutrition, cost reduction, convenience and variety. The formulation of emulsion based meat products differs according to the products prepared. The ingredients formulation and cost economics is presented in Table 1.

Traditional poultry meat products

The rich heritage of India contributes to wide range of traditional foods and has a role to play in health foods. Indigenous meat products are unique in their spicy flavour, simplicity and ease of preparation. They have the potential of becoming value added convenience products of good palatability. Over the passage of time, people developed several products such as curries, koftas, fries, kababs, biryanis, pickles, meat balls etc. with unique sensory attributes.

Semi-convenience chicken products

In Indian situation semi-convenience products such as marinated ready to cook variety of chicken cuts, minced meat mix, chicken emulsion etc would find great popularity when the same are available at strategic places. This semi-convenience minced chicken mix

or chicken emulsion can be prepared in curries products or can be used in making various fried products etc.

Table 1: FORMULATION AND COST ECONOMICS' OF CHICKEN PRODUCTS (100 kg)

Ingredients	Rate Rs./Kg	Prime Nuggets		Choice Nuggets		Economy Nuggets	
		Qt. (Kg)	Cost (Rs.)	Qt (Kg)	Cost (Rs.)	Qt (Kg)	Cost (Rs.)
Lean meat	250.00	70.00	17500	60	15000	50.0	12500
Refined veg. oil	75.00	9.0	675	8.0	600	7.0	525
Chicken byproducts (Skin Gizzard & Heart)	50.00	-		6		12.5	
TSP hydrated (1:1)	25.00	-		6	150	12.5	312.5
Ice water	00.50	10.0	5	9.0	4.5	7.0	3.5
Refined wheat flour	20.00	3.5	70	3.5	70	3.5	70
Table salt	10.00	1.75	17.5	1.75	17.5	1.75	17.5
Spice mix.	250.00	1.75	437.5	1.75	437.5	1.75	437.5
Condiment mix. (Onion: garlic -3:1)	30.00	4.00	120	4.0		4.0	
Sugar	40	0.3	12	0.3	120	0.3	120
STPP	680	0.4	272	0.4	272	0.4	272
Nitrite	160	0.01	1.6	0.01	1.6	0.01	1.6
Total			19110.6		16985.1		14896.6

Quality assurance of poultry products

Ensuring safety of poultry products is immense importance for export due to the implications of liberalized trade regulations. Pragmatic approaches for quality control are essential for exporting poultry meat and meat products, particularly in the competitive environment of trade liberalization. The pesticide and veterinary drug residues, antibiotic resistance of microbes, chemical residues, adulterants, food borne pathogen, emerging and re-emerging pathogens, risk from irradiation of foods and genetically modified foods are few of the safety issues.

Future Prospects of Poultry Meat Industry: Challenges and Opportunities

Presently necessary infrastructure and knowledge required for poultry meat industry development exists in India. However, there is great need for improvement in packaging, preservation, transportation especially the refrigerated transportation and the basic infrastructure for storage and transportation including the cold chain maintenance. No serious effort has been made to design and develop equipments indigenously to suit the requirements of small, medium, and large poultry processing units. The high-tech processing systems may not necessarily be relevant to the Indian conditions. Lack of dynamic linkage between research and development institutions and poultry processing industry is another

impediment in this regard. Uneven quality inputs, extension facilities, insecurity in poultry farmers, inadequate marketing infrastructure, unstable feed cost are some of the bottle necks.

Lecture-6

Scientific and hygienic processing of poultry: Cost analysis of live and dressed birds

for farmers interest By B. G. Mane, Department of Livestock Products Technology, COVAS, CSKHPKV, Palampur.

The production and processing of quality poultry meat and meat products are today's requirements. So that there is an urgent need for hygienic and quality chicken production to suit to the Indian conditions by establishing small modern processing units. The Poultry processing sectors in India have undergone rapid transformation and the overall condition of poultry processing improved considering the safety aspects of poultry meat due to the implications of liberalized trade regulations. However, the microbial contamination during processing is important aspects and subsequent quality of meat and meat products depends upon them. To produce the wholesome and hygienic poultry meat great care has to be taken from production to final processing to keep the consumer interest in poultry meat. This is also important due to various safety issues presently raised in globalized scenario such as pesticide and veterinary drug residues, chemical residues, adulterants, food borne pathogen, risk from emerging and re-emerging pathogens, antibiotic resistance of microbes etc. These problems will be sorted by programmatic approach from initial production to final processing giving due attention of scientific poultry rearing and hygienic processing. The following points are very crucial for production of wholesome poultry meat for human consumption.

Important Microbes of Poultry Origin Dangerous to Human Health

The poultry is high quality protein source through meat and eggs as well as pathogenic microorganisms such as Bird flu, *Salmonella spp.*, *E. coli* particularly *O157:H7*, *Listeria monocytogen*, *Campylobacter spp.*, *Yersinia enterocoliticus*, *Aeromonas hydrophila*, *Bacillus cereus*, *Clostridium perfringens*, *Clostridium botulinum*, *Aspegillus flavus* and many more microbes are potential danger to consumer health. The attachments of these microbes occur during slaughter and subsequent processing including production practices. So that great care is taken, otherwise quality of meat and meat products will deteriorates quickly and it is health hazard to consumer These microbial hazards has to be eliminated/reduced/controlled to protect the consumer.

Present Status of Poultry Processing in India

The poultry processing sector is still in infancy in spite remarkable growth in broiler production and requires vigorous input both from private and government to promote this sector to fulfill the ever increasing demands for quality poultry meat in domestic and export markets. However, recently over a dozen modern mechanized processing plants set up in the country, but they are running much below their installed capacity owing to less preference for frozen chicken, lack of cold-chain facilities and disorganized domestic market. These high-tech modern processing plants processing hardly about 5% chicken produced in the country besides a number of small modern processing units about 10-15%. These

modern processing plants produce dressed whole chicken, cut-ups chicken parts, boneless chicken meat and some value-added poultry products. Of the dressed chickens, about 75% are sold as hot dressed, chilled or frozen whole carcasses and remaining are marketed as processed value-added poultry products mostly in metropolitan cities.

Pre-Slaughter Care and Handling Poultry

The pre-slaughter care of bird is utmost importance for quality meat production. The bird should be handled carefully without any physical damages and includes the processes of catching, loading, transportation and unloading. The physical damages lower the value of dressed carcass.

Loading of Live Poultry

The birds are generally loaded in crates for transportation for slaughter purpose at early morning or late night without any disturbance to birds due to favorable climatic conditions. Just before loading the live birds following points has to be kept in minds:

- All the equipments such as feeder, waterers etc are removed to one side.
- The operation should be done very quickly
- Distance between the catching and loading place should be kept minimum.
- The light should be off or dim during collection of birds.

Crates Used for Loading Poultry

The three different types of crates are used for loading the birds. These are loose crates, fixed crates and new modules. The birds are generally loading in loose and fixed crates manually while in modules by mechanical devices. Recently mechanical harvesters are used for loading birds which are more humane as well as it improves the working condition for catching and reduce the labor.

Transportation of Live Poultry

The care should be taken that the birds feel comfortable during transportation. They should provide glucose water, protected from adverse environment conditions, direct sunlight and feeds when journey was long. These cares minimize the death and shrinkage losses and birds in healthy condition.

Receiving Poultry at the Slaughter House Plant

Make the arrangement that birds should arrive at the slaughter house plant, just one hour before actual slaughtering. If the journey was long then resting periods should be 12 hours for recoups the depleted glycogen during transportation due to exhaustion. The feeds are withdrawn 8-10 hours before the transportation of the birds. The fasting periods of at least 8-10 hours keeps intestinal contents minimum leads to less chance to breaking and subsequent contamination. Fasting period water should be provided but 4 hours of actual slaughter it is also withdraw. Only the healthy birds are to be received from poultry farms for slaughter and hanged on rails. The birds should not be hung more than 3 minutes for chicken and 6 minutes for turkey due to consideration of bird welfare and humane aspects.

Inspection of Poultry

The ante-mortem and post-mortem inspection has to be done to protect the consumer by scientific evaluation of birds by trained veterinarian. This is the crucial steps for production of safe and wholesome poultry meat.

Ante-Mortem Inspection of Poultry: The live birds are inspected after arrival at slaughter house. If the birds are kept for more than 24 hours they should be re-examined just before. This is indispensable safe and wholesome meat production for human consumption. The birds are inspected at rest as well as in motions in holding/lairage. This is essential because of some diseases or disease conditions are recognized only at ante mortem inspection. This would minimize risk of some zoonotic diseases transmitted to humans by contact or meat consumption, equipment contamination and subsequent process breakdown. Only healthy birds are passed for slaughter. The suspected birds are slaughtered at the end of day in separate block followed by detail post mortem inspection. On the basis of thorough inspection following three dispositions is taken by veterinary officer:

- The birds are fit for slaughter
- The birds are unfit for slaughter
- The birds are suspected for disease or abnormalities.

Post-Mortem Inspection of Poultry Carcasses: The inspection of dressed carcasses after evisceration including viscera followed by laboratory examination is called post mortem inspection. Ante mortem inspection reports are crucial for post mortem dispositions because the suspected birds are examined thoroughly and very carefully. In the post mortem inspection area, the intensity of light is kept at least 540 Lux. In this only sterilized knife and water were used and each organ is examined and only safe and wholesome carcasses are passed for human consumptions. The final decisions of carcass dispositions depend on the veterinary officer and takes decision considering human health. The following dispositions are taken at the time of post mortem inspections of carcasses:

- The carcass is passed for human consumption as a food.
- The carcass is passed for human consumption as a food only after removing the diseased or affected parts in localized conditions.
- The carcass is condemned in food chain as human foods.

Slaughter Technique of Poultry: The slaughtering starts from stunning and bleeding of poultry followed by various operations. These are suitable deal in the following discussion.

Stunning of Live Poultry: Birds are making unconscious just before slaughter is known as stunning. This is done to prevent the struggling of live birds during the killing process and makes the subsequent process easy and efficient to produce improved quality poultry meat. During slaughtering process keep in mind that the chickens should be stunned within 12 second of hanging on slaughters line. The electrical and gas stunning techniques are more commonly used for stunning the live birds. In the modern poultry processing plants birds are slaughtered by modified kosher methods which are humane and produce good quality meat. However, in India most of modern poultry slaughtering plants followed halal methods of slaughter.

Sticking and Bleeding of Poultry: The major blood vessels and artery in neck region is cut by sharp edge knife immediately after stunning the bird for efficient bleeding. A modified

kosher method is supposed to be efficient bleeding technique used in majority of modern slaughter plants all over the world. In the modified kosher technique of sticking jugular veins and carotid arteries are cut, while in halal method carotid arteries and jugular veins along with skin, oesophagus and trachea are cut. The Jatka methods followed in Hindu and Sikhs religions, in which the head of birds are removed in one stroke by sharp knife from body. The bleeding starts just after sticking and around 35-50% of total blood volume are lost or out of 9% total volume of blood in live birds maximum 50% blood is removed and remaining is presents in tissues and in offal.

Scalding of Poultry Carcasses: The immersion of birds in the hot water bath for few seconds for easy removals of feathers are called as scalding. The time-temperature of immersion is changeable and depends upon the age, species and the purpose of the bird subsequently used. The scalding of birds does only after the complete cessation of respiration of birds otherwise it will cause the contamination of the scalding water by entering it into the respiratory and digestive tract and subsequent contamination of carcass. The usual time-temperature combination used for scalding broiler chicken is 55°C for 1-2 minutes.

Plucking/De-feathering of Scalded Poultry Carcasses: The removing the feather by manually or by machine immediately after scalding is called de-feathering. The feather should be removed within one hour after slaughter otherwise extra force required for their removal and lowers the value due to disruption of skin. Manual de-feathering first large feather of tail and wings are removed followed by sides, legs, back, hip and finally the neck feathers. Machine de-feathering the feathers are deposited at the bottom of de-featherer by the action of continuously rotating rubber finger in which the birds are held against the direction of rotating wheel of machine. These deposited feathers are carried away by running water. The large feathers are easy to remove but some newly grown feathers remains attached to carcass are known as pin-feather. The process of their removed is called pinning.

Singing of poultry carcasses: On the surface of carcass the small hair like feather are remains even after picking and pinning. These hairs like feather are called filo-plumes. These filo-plumes are best removed by passing the carcass over through the blue flames of burners very quickly. This process is called singing of carcass. This process burnt all the filo-plumes and skin becomes clean. The microbial load is largely removed by this process.

Washing the carcass with wholesome water: This is done just after singing the carcass to removed the burnt matter adhere to carcass body by cold clean wholesome water. The microbial population is reduced once again on carcass surface if water is microbiologically safe. The carcass is washed by spray water or by dipping in water or pressure spray. Pressure spraying is nowadays used in modern poultry processing plants and sometimes small amount of chlorine (20 ppm) is added for obtaining the microbiologically safe meat.

Evisceration of poultry carcasses: The oil gland and feet of carcass is removed manually by knife or by mechanical cutter specially used for leg cutting just before the passing the carcass for evisceration. The evisceration process is crucial and important step in poultry processing to produce hygienic and improved microbial quality poultry meat and requires immense carefulness during eviscerations. This process should be done as early as possible after slaughter to avoid microbial transmission from gut to tissues. There should be separation between slaughtering and evisceration area. For evisceration chicken is hung by

two point suspension and turkey by three point suspensions by head, legs and hock joint additional to chicken. This suspension makes the birds in horizontal position for easy evisceration. The evisceration is done manually, semi-automatic and fully automatically.

Chilling of Carcasses: The carcass is chilled immediately after evisceration to inhibit the growth of microbial population presents on carcass surface to extend the shelf life of meat. The chilling also makes the meat tender. The carcass temperature is reduced to below 5° C or less uniformly within 2-2½ hours. The carcass chilling is done by different method such as cold air chilling, water immersion chilling and sprays water chilling. These methods are used depending upon facilities in modern poultry processing plant. After initial chilling the carcasses are kept for short period at 0°-3° C.

Weighing, grading and packaging of dressed carcasses: The carcasses are weighing individually or in batch, graded according to standards meant for that poultry species and packs as a whole or in cut up parts. These packs are distributed for marketing or kept in deep freezer at -18° C or less for long time storage.

TABLE 1: PRODUCTION AND MARKETING ECONOMIC COST ANALYSIS CHICKEN

Live weight of bird	Production cost	Farmer Selling Price	Market Selling Price (Live)	Difference in Price (I)	Market Selling Price (Dressed)	Difference in Price (II)	Differences in price (III)
2	100	120	160	40	190	70	90
2.5	125	150	200	50	235	85	110
3	150	180	240	60	285	105	135

Basis of above Calculations:

- Difference in Price (I)= Marketing selling price(live) - Farmer selling price
- Difference in Price (II)= Marketing selling price(Dressed) - Farmer selling price
- Difference in Price (III)= Marketing selling price(Dressed) – Production cost

If small scale dressing unit set by the farmers, he will get of Rs. 190.00 for his poultry of 2 kg weight chicken instead of Rs. 120.00 against production cost of Rs. 100.00. If processing cost is supposed to be Rs. 10.00 and he is selling dressed chicken Rs. 10.00 less than the market price. The net profit will be Rs. 70.00 instead of Rs. 20.00. Keeping the above tentative economic analysis in mind the best way is sell the dressed poultry by setting simple hygienic shop/unit instead of selling the bird to middle men or processors.

Lecture-7

Practical use of lactometer at field level and scientific method of preparation of

Paneer By Dinesh Krofa, Deptt. Of LPT, DGCN COVAS, CSK HPKV Palampur. HP

Lactometer is an instrument of standard weight and volume calibrated in such a manner so as to make it convenient for measurement of specific gravity. The specific gravity of milk varies with its composition. So we can say that by estimation of specific gravity we

can have an idea about adulteration, if any in the milk. It can also give us an idea of low fat level or so to say ghee/cream reduced from milk.

SPECIFIC GRAVITY: It is the ratio of weight of equal volume of given liquid to the equivalent weight of water at specific temperature. To measure specific gravity of milk, we use Lactometer and its average value is 1.028-1.030 for cows milk and 1.030-1.032 for buffalo milk. The accessory instrument required for using lactometer are Lactometer jar, Lactometer and dairy thermometer. Lactometer should be calibrated at 84°F.

PRINCIPLE OF LACTOMETER: It's a hygrometer with scale. It is based on principle of buoyancy i.e. body floating in liquid, sinks to the level which displaces the volume of liquid whose weight is equal to that of floating body.

PROCEDURE: Mix the sample, put the sample into lactometer jar up to 2/3rd of its capacity.

- Slowly immerse Lactometer in jar so that it floats freely.
- Note the Lactometer reading called OLR i.e. Observed Lactometer Reading.
- Record the temperature and determine Corrected Lactometer Reading by following formula:- $CLR = OLR + 0.5 \pm 0.1 \times (\text{Temp. difference})$ that means add 0.1 to O.L.R. for every 1° above 84°F or subtract 0.1 from O.L.R. for every 1° below 84°F.
- Finally Specific gravity of milk is calculate by following formula:-
- Specific gravity= $1 + \text{Corrected Lactometer Reading}/1000$

PRECAUTIONS:

- Note down the temperature of milk accurately.
- Never take specific gravity of freshly drawn milk, always note its specific gravity after 2-3 hrs so that air bubbles, carbon dioxide etc should escape.

Lecture-8

Scientific method of preparation of Paneer *By Dinesh Krofa, Deptt. Of LPT, DGCN COVAS, CSK HPKV Palampur.*

Himachal Pradesh happens to be possessing mountainous terrain mostly. The geography of the state makes the venture of Animal Husbandry very tough compared to other regions of the country. The situation is worsened by low fodder availability, inaccessible areas, lack of connectivity (roads), and very small land holdings. The tough terrains and the inaccessible areas make it difficult for the dairy farmers to efficiently utilise the land and forest resource as well this situation makes it difficult for the extension functionaries to reach the farming communities for extension of services. Processing of milk to products and forms which have extended shelf life compared to raw milk is very useful. Paneer happens to be one of the products which can be produced by the farmers residing in these far flung regions to extend the shelf like and transport the product to areas of market easily. This product can be produced easily with limited facilities which we expect under the given conditions of rural Himachal. As there is limited to no scope of marketing of the surplus milk produced by our farmers at the local area of these regions and raw milk must be marketed within only few hours of milking and people in these regions do not get time enough to make their produce reach the market areas. Processing of milk to Paneer provides the farmers of these areas with one to two days (shelf life extended) and the bulk

is reduced for the ease and convenience of transportation to the far market areas. The value of the produce of remote areas can be even more than those produced in other urban areas as we expect the produce coming from these areas as organic because of the fact that these places are far less polluted and chemical pesticides etc. infested, and this can make the produce to fetch more price. This organic status can be easily ensured by taking just few steps. Taking all this in consideration this lecture was delivered and practical demonstration conducted to the trainees.

PANEER: It is one of the most important milk products prepared by heat cum acid coagulation of milk. It is used as base material, for preparation of large number of culinary dishes. The minimum fat content of paneer should not be less than 50% on dry matter basis. Generally buffalo milk is preferred for preparation of paneer.

The material required for preparation of Paneer are Fresh good quality milk, Gas stove, Citric acid solution (2%), Muslin cloth, Weighing balance, knife, Pressing weight, Packaging material.

PROCEDURE

- Standardize the buffalo milk fat level of 5% (4% in case of cow milk).
- Heat the milk to the temperatures of 85-90°C for at least 5 minutes with constant stirring throughout.
- Filter the milk through muslin cloth.
- Cool the milk to 70°C.
- Add 2% freshly prepared hot solution of citric acid (70-75°C) to the milk with continuous agitation until clear greenish whey separates out.
- Stop the stirring after coagulation is complete.
- Allow the curd to settle down.
- Transfer the curd into a hoop lined with cheese cloth.
- Wrap the contents in the cheese cloth and press for about 15-20 minutes by applying pressure of 0.6 psi.
- Remove the paneer from the hoop and immerse it in the chilled water for about 2-3 hours to make it firm.
- Remove the chilled paneer from water and allow it to drain.
- Weigh the paneer and determine percentage yield.
- Cut the paneer into suitable size and pack in polythene bags.
- Store under refrigeration until disposal.

PRECAUTIONS

- Stir the milk continuously while heating to avoid burning of milk.
- The temperature of citric acid solution used for coagulation should be 70°C.
- Complete coagulation of milk should be ensured indicated by separation of clear greenish yellow whey.
- Allow the excess water to drain completely before packaging of paneer

Lecture-9

Scientific method of preparation of *Chicken Pickles* By Dinesh Krofa, Deptt. Of LPT, DGCN COVAS, CSK HPKV Palampur. HP

Our farmers have been motivated by the venture of poultry farming as it is lucrative, easy to manage, requires less labour, requires less investment, requires less space and is easy to market. Excellent varieties of breeds and lines have been developed by the scientists that help in increasing the profitability of the farmers. But it has been observed in the recent past that when there are diseases like bird flu in the news the farmers have to bear heavy losses because of the slump in the market. During such times stringent action is taken by the government and animal health personnel to condemn the diseases effected poultry birds. But because of the fear in the public even the healthy chicken certified by the agencies is difficult to market during the period. The farmers have made heavy investments and cannot afford to go on feeding the birds, have to dispose off the poultry bearing total losses. During such times the technology of pickling can be used to process the produce and to escape the slump period and store the healthy marketable chicken by increasing the shelf life to a few months and also to add value to increase their profitability.

The material required for the preparation of chicken pickles are as follows; half kg soft and good quality chicken, 10 lemon, half kg cooking oil, 100 gram salt, 25-100 gram red chilly (according to taste), 50 gram khus khus seeds, 4 garlic flakes, half tsp methi seeds, half tsp turmeric powder, 15 cloves, two cardamom, 8 cm cinnamon, 50 gram ginger.

PROCEDURE: Wash the chicken thoroughly and cut them into pieces of 1 to half inches. Mix cloves, cinnamon, cardamoms, khus khus seeds and grind to a fine paste. Mix the chicken pieces with turmeric and 1 cup of water and boil in a pan until all the water evaporates. Remove and keep aside. Heat oil in a pan, add chopped ginger and fry until brown. Also add chicken pieces, fry until golden brown, remove and cool them. Then add lemon juice, ground powders, garlic flakes, salt, chili powder and mix well. Keep the pickle in a jar and store it. This pickle remains for 3 months.

Lecture-10

Prevention of dairy animal diseases through managerial skills By Vipin K Gupta, Department of Veterinary Pathology, DGCN COVAS, CSK HPKV Palampur.

'**Prevention is better than Cure**', is true for dairy animal farming too, alternatively we can say that 'prevention is more economical than cure'. Treatment of diseases amongst animals is not a profitable enterprise. Therefore, our emphasis should be to raise the animals without any preventable disease. In order to prevent the diseases amongst animals effectively, one need to know the relation of diseases with age, season and stage of production of the animal etc. As you know, for profitable dairy farming, there are a set of diseases which can be prevented by timely vaccination. These include Foot & Mouth Disease (FMD) commonly called as '*muh khur ki bimari*', hemorrhagic septicemia (HS) called as '*gal ghotu*', Black quarter (BQ) as '*langra rog*'. There are effective vaccines available to be administered to the cattle & buffalo twice a year, once during the month of May and 2nd

during the month of November. Once the vaccination is ensured, usually there is no chance for these diseases to come. The animals are protected usually after three weeks of vaccination. These vaccines are of no use when the animal is suffering from the disease.

FMD: can spread by air, the affected animals may be managed by washing the mouth & hoof lesions with antiseptic (1:10,000 solution of potassium permanganate (*lal dwai*) is quite effective). In calves the disease is fatal due to its effect on heart.

HS: is more of a disease of buffaloes and usually cause death of the animal in 1-3 days of start. The most common manifestation is high rise of temperature, swelling of the face & neck region with difficulty in breathing. It must be treated on finding first sign of the disease. The disease is common during stressful weather conditions like rainy and winter season.

BQ: affect the healthiest animals with heavy musculature and the affected animals show signs of lameness due to leg weakness. If such cases are not treated in time may lead to death of the animal.

Survives from any of the above three diseases are not efficient/economical producers. Therefore, it is always better to go for timely vaccination rather than treatment.

Chronic Diseases: There is another set of slow diseases like tuberculosis (TB) and Johne's Disease (JD) which would kill the animal over a period of 2-3 years. These diseases are not treatable in animals and need to be identified by regular (annual) testing before they appear clinically and spread to other healthy animals. The animals found positive for any of the two diseases need to be separated from other healthy animals and may be put to sleep under veterinary supervision. Therefore it is advised to go for periodic testing for these two diseases with the help of Veterinary Doctor.

Parasitic infestations: Is a very big drain on the income from animal farming. These could be internal and or external parasites. The internal parasites are common in the liver and intestine but are also seen in the lungs. It would be ideal if, the parasites are identified with the help of nearest veterinary diagnostic laboratory and treated accordingly. The thumb rule is to go for periodic de-worming for 2 to 3 times a year as a matter of routine. Simply following regular de-worming schedule can enhance the production potential of the animals and increase the income. The internal parasitic load on the animals can be reduced to a greater extent by offering clean drinking water and the green fodder after drying it for a few hours to overnight. There could be infestation with external parasites like ticks & mites. The infestation with ectoparasites can be easily detected and treated with suitable insecticide spray in the shed & bathing/dipping the animals with BROOT or BUTOX (Deltamethrine) as per manufacturer's recommendations (*Take appropriate precautions while handling insecticides*). These external parasites not only make the animals anemic by sucking their blood but also transmit many diseases including babesiosis (blood in urine) & theileriasis (tick fever). The parasitic infestation not only weakens the animals but also predispose them for other diseases.

Mastitis: is a common problem of milk producing animals. The problem is more common under unhygienic conditions. The milk appears curdled/watery/stringy in case of mastitis and the affected quarter may be swollen & warmer. The animals must be treated as soon as

the condition is identified. The success rate decreases with delay in starting treatment for mastitis. The condition can be prevented by taking two important measures: 1. Thoroughly wash the teats with 1:10000 solution of '*lal dwai*' (Potassium permanganate) before and after milking. 2. Do not let the animals sit for one hour after milking by offering them some feed or fodder and moving them to a different place.

There is another type of mastitis called dry cow mastitis. The dry cow mastitis can be prevented by drying the animal in-milk slowly starting with skipping one time and then skipping a day and so on, rather than to give up milking all of a sudden. One needs to be more careful while drying high yielder.

Care of pregnant animals: Proper care and upkeep of pregnant animals can give higher milk yield besides preventing some metabolic conditions like milk fever. Animal in-milk should be dried at least 45 days before calving. They should be provided adequate feed, mineral mixture in addition to feeding one kilogram of bran commonly called '*choker*' every day for about one month before calving. The pregnant animal needs to be kept separate at the time of calving in a clean, dry & comfortable room.

Care of the new born calves: The first and foremost thing after the birth of the calf is antiseptic dressing of the navel. It can be easily done by cutting the naval cord about 4-5" from its attachment and inserting clean cotton swab soaked with betadine/tincture iodine solution into the opening of the naval cord and fasten with a clean thread holding the dressing inside. Proper dressing of the naval will save the animal from the conditions like liver abscesses, joint ill, septicemia, pneumonia etc. The next important step is to feed the calf with colostrum as early as possible after birth. It is helpful in two ways, one the calf would acquire passive immunity from the dam and the suckling reflex would help the dam to expel the placenta. Subsequently, until the age of three months the calf should be fed with milk equivalent to 1/10th of its body weight daily in two divided doses, morning & evening. We must de-worm the buffalo calf at the age of 15-20 days for round worms using Liquid Piperazine orally @ 10ml per calf of 25-30kg body weight. The cow calf can be de-wormed in the 3rd month of the age and subsequently periodic de-worming is required in both the cow & buffalo.

Lastly, feeding of mineral mixture as one of the standard component of the feeding schedule is very important, to meet the supply of the macro & micro minerals, depending upon the requirement of the animal. The production of the animals can also be enhanced simply by making available clean drinking water at all the time in a hygienic manner.

Summary: Thus it clear that a number of diseases can be prevented by timely vaccination, their identification, de-worming, instituting hygienic measures, taking care of the pregnant & new born, feeding mineral mixture and providing drinking water at all the time. These simple measures if adopted religiously can help in reducing the incidence of disease besides bringing in extra cash flow from the same existing animals.

Various processing methods of the coarse feed and conservation of green fodder

as silage *By Vinod Sharma, Deptt. of Animal Nutrition, DGCN COVAS CSK HPKV Palampur.*

A number of methods are available for processing the coarse feeding – stuffs for improving their voluntary intake and nutritive value. Thus grinding, chaffing, soaking in water, alkali treatment of straws, silage making etc. are the common methods for routine use:

- 1. Grinding** Grinding of roughage like straw decreases the digestibility but increases the intake.
- 2. Chaffing** The chaffing of the green fodders, grasses and straws also increases the intake by the animals with minimum wastage.
- 3. Soaking** Soaking of the wheat straw increases the intake but has no effect on the digestibility of the nutrients soaking of paddy straw removes some of the soluble oxalates and may improve its nutritive value.

4. Urea- molasses method of impregnation of wheat straw:

Wheat straw/Paddy straw	100 kg
Molasses/ flour (wheat/maize/barley)	10 kg
Urea	1 kg
Mineral mixture	2 kg
Water	5lit.

Method:

- i) Spread wheat straw in a pile of $\frac{3}{4}$ to 1 inch thickness.
- ii) Make the solution of 1 kg urea in about 2 lit. of water. Add 2kg mineral mixture and mix. All these with 3 lit of remaining water. Urea should be thoroughly dissolved before mixing with other materials.
- iii) Prepare the above solution and mix with molasses/ flour.
- iv) Spray these solutions on the straw/dry fodder/chopped grasses carefully and mix the material thoroughly.
- v) Feed this material as such to the animals or may be dried, stored and fed to the animals as and when required.

5. Ammoniation

Wheat bhoosa/dry grass hay (chopped)	100kg
Urea	4kg
Water	35kg

Method:

- i) Prepare a solution of 4 kg urea in 35 liters of water.
- ii) Sprinkle the urea solution on the bhoosa/ chaffed grasses by spreading the same evenly. The moisture content of this material should be around 45%.
- iii) Pack this treated material in a wooden box or in polyphone bags or in soil bunkers under pressure and render air tight.
- iv) The material should be fed to the animals by gradually increasing the level of feeding day after day.
- v) The material should be opened only after 40 days and feed after thorough aeration in the open to facilitate the escape of the unused trapped ammonia.

6. Silage making:

Silage is the green material produced by controlled fermentation of green fodder crops retaining all the nutrients and green colour with pleasant fruity odour.

Material :	Cropped green maize/ grasses/ sorghum	100.0 kg
	Molasses	5.0 kg
	Urea	0.5 kg
	Mineral mixture	0.5 kg

Method:

- i) Prepare the solution of 0.5 kg of urea in about 2 litres of water and mix with 5 kg molasses and 0.5 kg mineral mixture.
- ii) Chaff the green forage to the chop size of ½” to ¾” and mix the solution of urea, molasses, mineral mixture with 100 kg lot of the chopped fodder material.
- iii) Pack the material in the soil bunker and make the arrangement of proper air escaping from the material by through pressing.
- iv) Take out the after about 4-6 weeks in suitable lots for feeding to the animals.

Advantages of silage making:

- i) Silage can be prepared from green fodder crops when the weather does not permit for hay making.
- ii) Silage can be prepared from plants having thick stems and are generally not very suitable for hay making like sorghum, maize etc.
- iii) Weeds can also be utilized alongwith main fodder crops for silage making destroys majority of weeds seeds.
- iv) It is highly palatable.
- v) The organic acids produced in the silage are similar to those normally produced in the rumen of the animals and are metabolized in the same manner.

Urea Mineral Molasses Block

Composition

A	B	
40-45 % molasses	Salt	10%
8-10 % urea	Urea	10%
8-9 % binding material CaO binding (Bentonite)	Oilseed cake	10%
30% rice/ wheat barn	Rice bran/wheat barn	10%
0.2 % trace mineral	Maida	15%
	Mineral mixture	15%
	Molasses	30%

Method of preparation of bricks:

- Required quantity of urea and molasses is boiled for about half an hour to complete the binding of molasses and urea.
- After the boiling is complete, then remaining materials are accurately weighed and pured in the molasses-urea mixture.
- The molasses- urea other materials are mixed thoroughly and desired quantity of bricks are prepared after putting above mixed material in the brick making machine under the pressure for 15-20 minutes.
- The bricks are taken out of the pressure machine and kept foe cooling for some time the bricks then can be wrapped in the old newspapers/polythene sheets (in the rainy season to protect from the moisture as these are hygroscopic in nature.

Formation of complete feed in the form of densified blocks:

Formation of complete feed in the form of densified blocks utilising promising local roughages in suitable proportion blended with quality ingredients such as cereals-maize, wheat, oil seed cake, mineral mixture molasses is the only methodology to improve nutritive value of existing feed recourses for livestock with economic viability. Densified feed blocks with locally available roughages viz wheat straw and concentrate in the ratio of 70:30 and 60:40 (Table:3 for animals yielding 6-8 and 10-12 liter milk/ animal /day respectively, can be formulated in a feed block machine at pressure of 4000 PSI. Feeding of densified feed blocks improve both growth rates in calves and milk production in cattle. These blocks offer several advantages such as

1. Reduction in storage space as well as transportation charges to the tune of five to six times.
2. Proper and judicious utilization of locally avail able feed and fodder resources , which other- wise not utilized
3. Value added product with no wastage of crop residues.

Composition of 3kg complete feed blocks

S.No	Items	Lactating cows: 3 block / animal/day		Calves
	Forages/Roughages:	6-8 lit milk	10-12 lit milk	Growth
	Concentrate			

	(70:30)	(60:40)	study(70:30)
1. Forages/Roughages	2.100kg	1.800kg	2.100kg
2. Concentrate			
1.Cereals Crushed	0.325kg	0.400kg	0.325kg
2.Oil seed cakes			
a.) Cotton seed cake			
b)Soyaflakes	0.455kg		
c.)Mustard cake	-	0.450kg	0.225kg
3.Molasses	-	0.225kg	0.230
4. Mineral mixture	0.100kg	0.100kg	0.100kg
	0.020kg	0.025kg	0.020kg
3. Total	3.00kg	3.00kg	3.00kg

Lecture-12

Scientific Poultry management By Vinod Sharma, Asstt. Professor, Deptt. of Animal Nutrition, DGCN COVAS CSK HPKV Palampur. HP

Some important principles for successful poultry rearing

- Keep one type of birds at one time at the farm,
- Always try to buy chicks from same hatchery.
- The new flock should be introduced under complete hygienic conditions.
- Proper care should be taken regarding biosecurity.
- There should be a disinfectant dip at all the entry points of shed.

Before the arrival of chicks:

- Take out the litter and put it in a litter-pit.
- Clean the roof, walls, windows and floors with a broom and put the dust in the litter-pit.
- Spray a solution of water and formaline (1:9) in the shed.
- Wash the shed by starting from roof, then walls and curtains and floor, and let it dry.
- Spray the solution of water and fromaline (1:9) so that all parts of shed are wet with the solution,
- Also spray this solution on outside the shed at least 20 feet on all sides of shed.
- Turn the brooders on one night before the arrival of chicks.
- The temperature of brooder room should be 10-15^o F lower than the brooder temperature.

After the arrival of chicks:

- Offer only water for drinking after the arrival of chicks for 4-5 hours.
- Offer 100-150 g balanced feed per 100 birds by spreading it on newspaper.
- Record brooder temperature from 2 inch above the brooder floor and 4-5 inch in the inside of brooder.
- The relative humidity should be above 60% when the chicks are young and afterwards it should be lower than this.
- The temperature of room and brooder should be decreased slowly as given below:

Temperature of brooders and brooder room.

Week	Brooder temperature (°F)	Room temperature (°F)
1	90-95	80-85
2	85-90	75-80
3	80-85	70-75
4	75-80	65-70
5	70-75	60-65
6	65-70	60

- Temperature should be maintained at 70 °F, but it should never be below 60 °F.

Space requirements for broilers (per broiler).

Week	Brooder (sq.inch)	Living space (sq.ft)	Feeding space (linear inch)	Waterer space
1	6-8	0.2	1	1/8
2	6-8	0.3	2	1/8
3	6-8	0.4	2	1/4
4	6-8	0.5	3	1/4
5	6-8	0.75	4	1/4
6	6-8	1.0	4	1/4
7	6-8	1.0	4	1/3

- In hot weather the waterer space should be doubled slowly and the living space should be increased by 15-25 % in summers and rainy season.

- The success of management can be evaluated from the feed consumption and weight gain which should be as follows:

Weekly feed consumption and weight gain of broilers.

Week	Mortality (%)	Average weight (g)	Feed intake per day (g)	Feed intake per week (g)	Cumulative feed intake (g)	F.CR.
1	1.4	120	16.4	115	115	0.95
2	2.4	306	48	336	451	1.47
3	2.8	615	81	567	1018	1.65
4	3.2	1020	115	805	1823	1.78
5	3.6	1426	131	917	2740	1.92
6	4.5	1775	150	1050	3790	2.15

- Weigh randomly 50 birds every week and work out the FCR. Compare it with values given by the hatchery. If there is a variation try to find out the reasons.

Lecture-13

Clean Milk Production and its Public Health Significance. *By Dr. A.K.Panda, Department of Veterinary Public Health, DGCN COVAS, CSK HPKV Palampur.*

The Milk of the mother is the best food for infants, breast feeding is in some cases impossible and cow’s milk is substituted for it. Its use however entails certain difficulties and dangers. The composition of cow’s milk differs considerably from Human, but it may be modified so as to render it a suitable food. A much more important danger connected with the use of cow’s milk is that it may contain bacteria which cause disease in those who consume it. The source of these bacteria is disease of the cow, disease of the milker or other workers, and addition of cow’s faeces to the milk. It is with these bacterial dangers, their cause and the method of their elimination is of concern.

Pre-requisites for Good Milking:

Milking is the key operation on a dairy farm; it depends on the income derived. Any amount of scientific feeding or possession of high yielding cows will not help if the milking is inefficient.

Milking is an art requiring experience and skill. Milking should be conducted gently, quietly, quickly, cleanly and completely. Cows remaining comfortable yield more milk than a roughly handled and excited cow. Maintenance of clean condition in the milking barn results both in

better udder health and production of milk that remains wholesome for longer time. The act of milking should be finished within 5 to 7 minutes, so that the udder can be emptied completely so long as the effect of oxytocin is available. Complete milking has to be done, lest the residual milk may act an inducer for mastitis causing organisms and the overall yield may also be less.

Preparation for Milking:

The milking barn should be thoroughly washed and scrubbed after each milking so that the barn will be clean and dry, before the subsequent milking is commenced. No dusty feed should be fed during milking. The hind quarters and thighs of cows should be brushed, and washed if lot of filth-is accumulating on them. Buffaloes should invariably be washed during summer; during severe winter brushing should be resorted to. Just before milking (after suckling by calf, if weaning is not practiced) the udder should be wiped with a cloth dipped and squeezed in some weak antiseptic solution. In winter the cloth may be dipped in warm antiseptic solution.

A part from cleanliness of cows and their udders, the milkers as well as the milking pails should be clean. The milkers should wear clean dress and cover their heads with suitable caps, lest loose hairs may fall in milk. Their nails should be well trimmed and their hands clean and disinfected between each milking by washing in antiseptic solution. Milkers obviously ill and having filthy habits like spilling, blowing nose etc. should not be used.

After each milking the milking pails should first be washed with warm water, scrubbed well using suitable dairy sanitizer and then rinsed well with clean cold water. Afterwards, they should be stacked neatly in racks -upside down, until next milking. Milking cans should also be treated similarly. Sanitary milking pails with dome-shaped top should be used instead of open buckets or vessels. A milk strainer should invariably be used before milk of each animal is poured into the milking can.

Pay attention to the routine of milking operations. Milch animals are sensitive animals. They get accustomed to certain routines and any sudden change in the routine will disturb them resulting in reduced yield. Experienced milkers should be put on first calver cows while/novices should first be tried on older cows. An ideal proposition is to rotate milkers among a group of cows so that the cows will get accustomed to all. Also milk cows at the same home every day. Any change in timing of milking or even change in ration should be brought about gradually.

Milking Procedure:

In India hand milking of cows is still the most common practice. Cow's are milked from left side. The order of milking the various teals also differs. Tents may be milked cross wise or for equareters together and then hind quarters together or teats appearing most distended milked first. The milk must be squeezed and not dragged out of teats. The first few strips of milk from each teat should be let on to a strip cup to see clues in milk for possible incidence of mastitis. This also helps in getting rid of bacteria which have gained access and collected in the teat canal.

Stripping and full-hand milking are the two commonly used methods of milking. Stripping consists of firmly seizing the teat at its base between the thumb and forefinger and drawing them down the entire length of the teat pressing it simultaneously to cause the milk to flow down in a stream. The process is repeated in quick succession. Both hands may be used, each holding different teat, stripping alternately.

The full hand method comprises of holding the whole teat in the first finger encircling the teat. The base of the teat is closed in the ring formed by the thumb and forefinger so that milk trapped in the lent sinus may not slip back, into the gland duct. Simultaneously, teat is squeezed between the middle, ring and little fingers and the hollow of palm, thus, forcing the milk out. This process should be repeated in quick succession. By maintaining a quick succession of alternate compressions and relaxations the alternate streams of milk from the two teats sound like one continuous stream. Many milkers tend to bend their thumb in, against the teat while milking. This practice should be avoided as it injures the teat tissues.

Full hand milking removes milk quicker than stripping, because of no loss of time in changing the position of the hand, Cows with large teats and she-buffaloes are milked by full-hand method; but stripping has to be adopted for cows with smaller teats for obvious reasons, Full-hand method is superior to stripping as it simulates the natural suckling process by calf. Stripping causes more irritation to teats due to repeated sliding of fingers on teats; and so discomfort to cows. In spite of these drawbacks when all milk that is available is drawn out by full-hand method, stripping should be resorted to with a view to milk the animal completely; the last drawn milk is called stripping and is richer in fat.

In India, milkers are mostly accustomed to meet hand milking. They moisten their fingers with milk, water or even saliva, while milking. This should be avoided for the sake of cleanliness. Wet-hand milking makes the teats look harsh and dry chafes, cracks and sores appear which are painful to animal. The hands should be perfectly dry while milking. When cracks and sores are noticed on teats, some antiseptic ointment or cream should be smeared over them after milking.

Lecture-14

Care of Milking Animals. *By Dr. A.K.Panda, Department of Veterinary Public Health, DGCN COVAS, CSK HPKV Palampur.*

The routine of management practices like feeding and milking and caring should be followed some time each day, being animals are more sensitive habitual for timing.

- **Feeding & watering:** The adequate clean & fresh water should be provided. An adult dry cow drinks 30-32 liters of water per day besides it requires 4 liters of water for every liter of milk production. Also, the water consumption increases when air temperature rises. The production ration should be given the additional allowance of ration for milk production over and above maintenance requirement. One kg additional amount of concentrates is required for every 2.5 kg of milk.

- **Housing:** Good housing is required for protecting animals from heat, rains and winds. Also, proper drainage, ventilation and exposure to sunlight must be there. These factors must be available in any type of housing chosen.
- **Cleaning & grooming:** Cows should be kept clean both for clean milk production and health of animals, it requires daily brushing which removes, dirt and loose hair. The regular grooming helps to keep skin clean, helps for blood circulation.
- **Disease control:** The prevention of disease & parasite infestation of the herd is most important. To achieve this, keep the sanitation by keeping the housing & other places clean and regularly disinfected. Many diseases are also prevented by timely vaccination.
- **Exercise:** The cows should be provided free movement to give the needed exercise.
- **Milking:** The udder and teats should be washed with warm water mixed with KMnO₄ solution and wiped to dry before milking solution and wiped to dry before milking. The milking should be conducted cleanly, gently, quietly, quickly and completely by suitable method of milking. It should be completed within optimum time period of seven minutes.
- **Breeding:** Cow should be bred at 60 days after date of parturition which helps good reproductive health of cow.

Lecture-15

Zoonotic diseases: prevention and control *By Atul Gupta, Department of Veterinary Public Health DGCN College of Veterinary & Animal Sciences, CSK HPKV Palampur-176062*

The bond between humans and animals has been recognized for many years and livestock ownership has been associated with both emotional and health benefits. Intimate and prolonged contact between man and animal facilitates the transmission of various communicable diseases between them. These diseases (zoonoses) are more prevalent in developing countries especially in the rural areas. These diseases virtually stunt the economic and social growth also. Prevention means measures designed to exclude disease from an unaffected population and Control, describes the efforts directed toward reducing the frequency of existing disease to levels biologically &/or economically justifiable or otherwise of little consequences. Lack of authentic data and awareness regarding the occurrence of zoonotic diseases and their true impact on public health have acted as major obstacles in instituting adequate and effective prevention and control measures. There are more than 150 zoonotic diseases and to discuss all is beyond the scope of this article. Thus the information regarding the control and prevention of only few important bacterial and viral zoonoses which are of significant importance in H.P. scenario is being presented here.

TUBERCULOSIS: Tuberculosis (TB) describes an infectious disease that has plagued humans since the Neolithic times. Tuberculosis (TB) is a bacterial infection. The bacteria usually attack the lungs, but they can also damage other parts of the body. The transmission of TB from *animals to man* take place through (i) direct occupational exposure to infected animal/carcass (ii) ingestion of contaminated or unpasteurized milk, or raw or inadequately

cooked meat from infected animal. *Man to animal* transmission may occur by direct exposure of animal to infected farm worker or when a farm worker with renal TB urinates in the cow shed. The transmission of TB from *man to man* takes place through the air when a person with TB of the lungs or throat coughs, sneezes or talks. The *animal to animal* spread occurs through (i) infected pastures (ii) inhalation of infected mucus droplets (iii) ingestion of infected milk by new born etc. In animals the most common signs of TB is emaciation, cough, dry & harsh body coat and swollen lymph nodes. In man, it is characterized by lung infection with coughing, greenish or bloody sputum, chest pain, weight loss, fever and anorexia along with damage to other parts of the body (Bones, Kidneys, Lymph Nodes, Genital Tract, Brain etc.)

Control & Prevention: In man 1. Periodical health check up of farm workers for tuberculosis. 2. Avoid eating milk and milk products from infected animal and boil the milk properly before consumption. 3. Diet should be balanced (consisting of vitamins, minerals, calcium, protein and fibres). 4. Keep your lungs fresh with lot of fresh air and avoid contact with infected people (with harsh, dry and violent coughing) and their discharges. 5. BCG vaccination and chemotherapy.

In animals 1. Avoid overcrowding of animals in the sheds. 2. Isolation and segregation of infected or suspected animals. 3. Provide good hygienic conditions in the sheds. 4. All animals should be tested regularly. 5. Vaccination and chemotherapy

LEPTOSPIROSIS: Leptospirosis, an infectious disease that affects humans and animals, is considered one of the most widespread zoonosis in the world. It is caused by bacteria of the genus *Leptospira*. Transmission of leptospirosis takes place through direct contact with the urine of infected animals or ingestion of urine contaminated food and water. Humans contract leptospirosis through domestic, occupational and recreational activities, which bring them into contact with fresh surface water or wet soil contaminated by the urine of chronically infected mammalian reservoir hosts. Clinical manifestation of leptospirosis often ranges from mild illness to severe life threatening disease with jaundice, renal failure, respiratory distress or abortion during pregnancy.

Control & Prevention: In man 1. Personal Hygiene (avoid swimming or wading in water that might be contaminated with animal urine, drink boiled milk and water etc.). 2. Protective clothing or footwear should be worn by those exposed to contaminated water or soil because of their job or recreational activities. 3. Rodent proofing food supplies and buildings. 4. Treatment may be used concomitantly with vaccination.

In animals 1. Avoid contamination of drinking water and feed 2. Isolate infected animals and avoid overcrowding in pastures and sheds. 3. Proper cleanliness and disinfection of the premises. 4. Vaccination of animals.

SALMONELLOSIS: It is a common worldwide zoonoses caused by bacteria *Salmonella*. By and large, poultry has been reported to be single largest reservoir of salmonellosis. This disease is transmitted by consumption of faecal contaminated feed and water and is characterized by diarrhea, vomiting, dehydration, and low-grade fever.

Control & Prevention: In animals 1. Immunization in farm animals. 2. Use of hygienic animal feed. 3. Proper sanitation and disinfection of farm premises. 4. Hygienic slaughter and pasteurization of milk 5. Proper disposal of solid and liquid waste.

In man: Special attention should be given to personal hygiene to prevent fecal-oral exposure along with supportive care, bed rest, and electrolytic fluids.

RABIES: Rabies is a zoonotic that is caused by a virus. Rabies infects domestic and wild animals, and is spread to people through close contact with infected saliva (via bites or scratches). The disease is present on nearly every continent of the world. Once symptoms of the disease develop, rabies is fatal. Dogs continue to be the main carrier of rabies in India and are responsible for most of the human rabies deaths. Humans most often become infected with rabies through the bite or scratch of an infected dog or cat. The early symptoms of rabies in people are similar to that of many other illnesses, including fever, headache, and general weakness or discomfort. As the disease progresses, more specific symptoms appear and may include insomnia, anxiety, confusion, slight or partial paralysis, excitation, hallucinations, agitation, hypersalivation (increase in saliva), difficulty swallowing, and hydrophobia (fear of water). Death usually occurs within days of the onset of these symptoms.

Rabid animals may become aggressive, combative, and highly sensitive to touch and other kinds of stimulation and they can be vicious (furious form). There is also a "dumb" form of the disease in which the animal is lethargic, weak in one or more limbs, and unable to raise its head or make sounds because its throat and neck muscles are paralyzed. In both kinds of animal rabies, death occurs a few days after symptoms appear, usually from respiratory failure.

Control & Prevention: The advent of scientific medicine makes rabies control possible, not by cure but by prevention. Unlike other immunizations, the rabies vaccine is administered after exposure to the virus. Safe and effective vaccines are available to prevent rabies in animals and in humans before and after suspected exposures. Vaccination of domestic animals (mostly dogs) has led to reduced disease in several developing countries. Post-exposure care to prevent rabies includes cleaning and disinfecting a wound, or point of contact, and then administering anti-rabies immunizations as soon as possible. No matter where the wound is, authorities emphasize that the first and most valuable preventive measure is thorough cleaning of the site with soap and water, and immediate medical attention.

FOOT AND MOUTH DISEASE: Foot-and-mouth disease (FMD) is a severe, highly contagious viral disease of cloven-hoofed ruminants. Man's susceptibility to the virus of foot- and-

mouth disease (FMD) was debated for many years. Today the virus has been isolated and typed (type O, followed by type C and rarely A) in many human cases. So no doubt remains that FMD is a zoonosis. Considering the high incidence of the disease (in animals) in the past and in some areas up to date, occurrence in man is quite rare. In FMD in man there are vesicles in the mouth or on the hands and feet.

Control & Prevention: In animals 1. Immunization in animals (strategic vaccination) 2. Use of hygiene in animal housing and management 3. Proper sanitation and disinfection of farm premises. 4. Proper disposal of solid and liquid waste.

In man: Special attention should be given to personal hygiene

Thus in nutshell following different strategies for prevention & control of zoonotic diseases can be applied:

1. Quarantine, 2. Slaughter, 3. Vaccination, 4. Chemotherapy, 5. Movement of Host from 'high risk' areas, 6. Control of vectors by destruction (insecticide) and disinfection, 7. Environment &/or Management control and 8. Genetic Improvements of animals

The causative agents of zoonotic diseases are bacteria, viruses, parasites, and fungi. Possible zoonotic exposure can be eliminated by good personal hygiene and handling of animals in a prescribed manner. Frequent hand washing with an approved disinfectant must be a priority that is strictly adhered. Good hygiene will also prevent cross-contamination of non-zoonotic diseases from animal to animal. Do not have hand-to-eye or hand-to-mouth contact while working with animals or soiled animal caging, bedding, and accessories. Handling animals in the prescribed manner for that species can prevent zoonotic exposure through bites, scratches, and abrasions. Thus, a combination of various techniques can be applied to prevent & control a disease.

Lecture-16

Ectoparasites of domestic animals and their management *By Devina Sharma, Deptt.of Veterinary Parasitology, DGCN COVAS,CSKHPKV ,Palampur.*

Ectoparasites have a major effect on the husbandry, productivity and welfare of livestock. Ectoparasites are responsible for economic losses to livestock producers. Direct losses are a result of discomfort and damage caused by the parasites. Discomfort results in drops in milk production and retarded growth rates. Feeding activity of the ectoparasites may result in significant blood loss, secondary infestations, pruritus. Ticks, mites, biting & non biting flies, sheep keds, lice, fleas etc. are common ectoparasites and they cause direct damage to skin and other subcutaneous tissues. A number of ectoparasites are associated with livestock. These are:

Ticks: Ticks are responsible for major economic losses amongst livestock in the world and have adverse effect on livestock host in several ways and parasitize a wide range of vertebrate hosts, and transmit a wider variety of pathogenic agents than any other group of arthropods. Some species pass their entire life on the one host, others pass different stages of the cycle on successive host, and others are parasitic only at certain stages. Adult ticks require blood for reproduction. Once they attach to a host they feed for about a week

before mating. The female then lays eggs off the host. Ticks cause damage to hides and loss of production, anemia and death when they are present in large numbers. **Fleas:** Fleas are small, usually dark colored (for example, the reddish-brown of the cat flea), wingless insects with mouth-parts adapted to feeding on the blood of their hosts. Their legs are long, well adapted for jumping: Fleas are not only a nuisance to humans and their pets, but can cause medical problems including flea allergy dermatitis, secondary skin irritations etc.. Also, fleas may transmit bubonic plague and any other disease from human to rodent to rodent and from rodent to humans.

Lice: Lice are small, wingless and flattened insects, with stout legs and claws for clinging tightly to fur, hair and feathers. They spend their entire lives on their host animal and are generally highly host-specific. Heavy louse infestations may cause pruritus, alopecia, excoriation and self-wounding. Severe infestation with sucking lice may cause anaemia.

Mites: Infestations of mites cause dermatitis in all species. The mites cause intense itching and discomfort which is associated with decreased feed intake and production. Scratching and rubbing caused by mites result in extensive damage to hides and fleece. Mites are able to cause mange on different species of livestock but are somewhat host specific, thus infecting some species more severely than others.

Flies Non-biting flies may feed on the secretions from the eyes, nose and any small wounds. This distracts animals from grazing, causing a reduction in growth and productivity. Non-biting flies can act as mechanical vectors for a whole range of pathogens, from viruses to helminthes. The growth and performance of nearly all farmed animals are adversely affected by flies, especially when they are present in high numbers. Infested animals become harassed and feed intake is drastically reduced. The result is significant reductions of meat and milk production and serious economic losses.

CONTROL METHODS: A number of different control methods are available to prevent and/or treat ectoparasites. The use of ectoparasiticide / insecticides is still the basic procedure for controlling most ectoparasite, but various methods are being developed to act in addition to, or in synergy with these products. These methods are classified as ecological control (modification of the environment of the parasite), biological control (predation, parasitism, action of pathogens, etc.), genetic control (release of sterile males, hybridization, and genetic manipulations) and mechanical control (insect traps, use of repellents. Administration of the correct treatment is very important. Only the use licensed Veterinary Medicines should be done; always the registered Veterinary practitioner should be consulted before the application of these chemicals and manufacturer's guidelines for use and disposal of the product exactly should be followed to get maximum effectiveness and to prevent any environmental contamination. Wrong treatments are often ineffective and can select for drug resistance. The treatments should be repeated regularly to prevent the reinfestations. There are various methods of application of ectoparasiticide like dipping, dust, spray races, showers, bath etc. Control of fleas, ticks and flies involves not only treating the animal but also its environment. Fumigation or spray of the animal houses, articles and other things with ectoparasiticide has to be undertaken. Because the ticks, lice, fleas etc. attach to various parts of the body of animal, treatment has to applied to the whole body. For the control of ticks, access of smaller animals like rats, rabbits, pigs, birds,

bats etc to the animal houses should be checked. Doors and windows should be proper so that smaller animals especially rodents do not enter. Wood, furniture and other material should not be stalked in the animal shelters as they provide site for the females to lay eggs. Cracks and crevices in the walls and floors of the animal houses should be filled up and ectoparasiticide should be sprayed in these cracks and crevices as females lay their eggs here also. The animal sheds should always be kept clean and dry.

By keeping all these things in mind, the effective control and prevention of these ectoparasites can be achieved.

Lecture-17

Important helminthic infections in animals and their control By R.K.Agnihotri, Deptt.of Veterinary Parasitology, DGCN COVAS, CSKHPKV, Palampur.

All helminths can be divided in three major groups:

- A. Trematodes (Commonly called as flukes)
- B. Cestodes (commonly called as Tape worms)
- C. Nematodes (Commonly called as round worms)

Trematodes: Majority of the trematodes are dorsoventrally flattened leaf like, some have flashy bodies while others are thread like. Following are the important disease caused by the trematodes:

Fasciolosis: This disease is caused by leaf like flat worms which are 25-75 mm long and upto 12 mm in width. They are commonly called as liver fluke and found in liver and bile ducts of the animals (sheep, goat, cattle, buffalo, wild ruminants, rabbit ,horse, dog.cat etc.)These worms are more harmful in sheep and goat than other animals. Skin of the animals become dry, wool fall in patches and they look weak and emaciated. There may be occasional diarrhoea or constipation. In cattle digestive disturbance are common. Animals mainly suffer from constipation and diarrhoea is seen only in last phase of the disease.

These parasites require a snail (Fig.1) species to complete its life cycle



Fig.1

Diagnosis: On observing the symptoms one can suspect this disease. For confirmative diagnosis, the faecal sample of the diseased animal is examined for the detection of the eggs.

Treatment and Control of the disease: On confirmation of the disease, the infected animal/s should be treated by the Veterinary doctor.

Appropriate measures should be taken to prevent the disease in animals for which following steps are taken into consideration:

- The faeces of infected animals should be disposed off at a proper place, preferably in a pit.
- Breeding places of snails should be eliminated by improved drainage and the areas like drainage ditches and seepage from springs may be fenced off.
- Ducks and frogs may be reared in snail infested area which feed on snails.
- Snails can be physically exterminated and buried in deep soil.

- The anthelmintics may be given after rainy season, after consultation with Veterinary doctor.

Amphistomiasis:

This disease is mainly found in sheep/goat/cattle and caused by different species of flukes which have different shape and size. They are usually thick and circular in transverse section. Immature stages of these parasites are responsible for causing severe fluid foetid diarrhoea, marked weakness and even death in severe cases. Infected animals are thirsty and drink water at frequent intervals.

Diagnosis: On observing the symptoms one can suspect this disease. For confirmative diagnosis, the faecal sample of the diseased animal is examined for the detection of the eggs.

Treatment and Control of the disease: same as in Fasciolosis.

Cestodes

Commonly they are called as tape-worms. They have a scolex, a short un-segmented neck (absent in some) and a strobila consisting of variable numbers of segments. Majority of these tape worms are found in the intestine of the animals. These parasites affect all the species of animals.

Treatment and Control of the disease:

- Infected animals (ruminants) should be treated for adult tape worms at regular intervals. The ploughing and reseeded of pasture may be done to reduce the mites which act as intermediate host for the tape worms of ruminants.
- Feed and water of sheep and goats should not be allowed to contaminate with the faeces of dogs.
- Dogs should not be allowed to live in the surroundings of sheep and goat farms
- To reduce the environmental contamination with the eggs of tape worms of dogs, they should be treated for tape worms at regular interval.

Nematodes:

This class contains cylindrical worms having both ends somewhat pointed. Body is unsegmented. They are from few mm to several centimetres in size. They are found in different organs and body parts of animals.

Neoascariasis:

This disease is found in cattle and buffalo calves. Light infection may pass unnoticed; however, heavy infection may produce symptoms of diarrhea and steatorrhoea (passing of heavy, pale, greasy faeces). Animals pass mud colour and bad smelling faeces. In India, this parasite contributes greatly to buffalo calf mortalities.

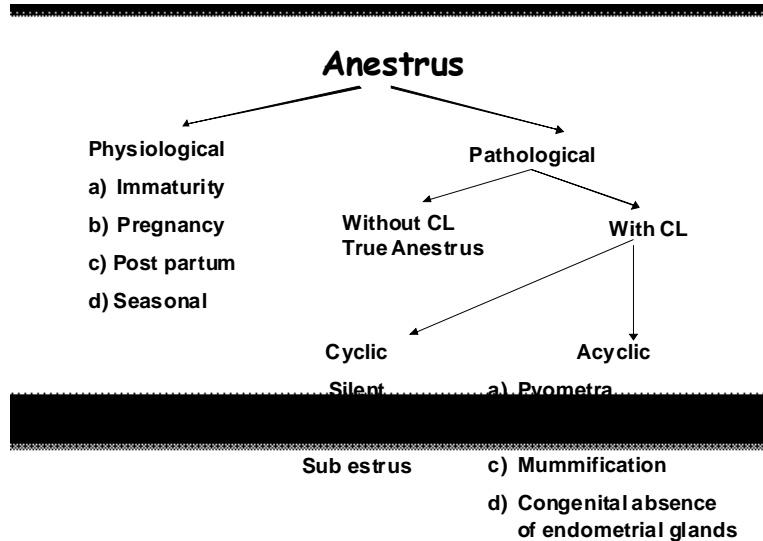
Diagnosis: Faecal examination for detection of eggs.

Treatment and Control of the disease: On confirmation of the disease, the infected animal/s should be treated by the Veterinary doctor. The calves may be treated as early as 40 days after birth as they acquire this infection from their infected mother.

Lecture-18

ANESTRUS - ITS CAUSES AND MANAGEMENT AT FARMERS LEVEL BY DR. Amit Sharma, Department of Animal Reproduction, Gynecology & Obstetrics, DGCN COVAS, CSK HPKV, Palampur. HP

It is defined as the period of sexual quitude i.e the period when the animal is sexually inactive. There are many etiological agents responsible for the malady.



CAUSES OF ANESTRUS

Key points in management of anestrus:- (Farmer's doing)

- Scientific feeding of dairy animals.
- Regular deworming after every three months.
- Regular use of ecto parasiticial drugs for animals as well as inside the animal sheds for protection against external parasites.
- Proper supplementation of mineral mixture and iodized salt in diet of dairy animals.
- Proper observation of the signs of estrus.

If the problem still persists then visit the Veterinary doctor for:-

- Gynecological examination of the affected animals to ascertain the status of different parts of genitalia.
- Proper identification of the etiology responsible and therapeutic measures to rectify the problem.

Lecture-19

First aid in common wounds. By Dr. Amit Kumar, Department of Veterinary Surgery & Radiology, DGCN COVAS CSK HPKV Palampur. HP

There are various kinds of wounds that occur in animals, most commonly as the result of accidents, fall, trauma, dog bite, attacks by wild animals and human malice. The basic open wound types include:

- Incised
- Lacerated
- Penetrating (Gored)
- Gunshot
- Poisoned
- Punctured/Bite wounds
- Virulent
- Ulcerative
- Erosive

Open wounds need to be attended to promptly whether they are bleeding or not. Open wounds are contaminated wounds, and are likely to get infected unless properly cleaned, sutured closed, drains placed if there is a large amount of pocketing under the skin, and the patient should be administered antibiotics. The sooner the wounds are addressed, the faster the healing occurs with fewer complications. The first aid is very important in wounds irrespective of their type.

Symptoms of wounds

- Bleeding
- Stiffness
- Sore swollen area on body
- Swelling and discharge form a small hole
- Odor
- Anorexia
- Lethargy
- Fever
- Acute onset of "fracture-like" lameness

First Aid:

- Identification of wound
- Control of bleeding
- Thorough cleaning of wound
- Protection from external contamination
- Tetanus Toxoid
- Anti rabies treatment
- Wound dressing

Every wound WILL HEAL- some just take a lot more time, veterinary treatment, and nursing care to achieve adequate healing.

Lecture-20

Bandaging techniques *By Dr. Amit Kumar, Department of Veterinary Surgery & Radiology, DGCN COVAS CSK HPKV Palampur. HP*

Bandages are used for a variety of reasons, but whether it is for support, protection or first aid purposes, they must always be applied in the correct manner and for the right reasons. These can play an important role in providing good wound healing. In veterinary surgery, it is often necessary to be innovative in the techniques used to bandage wounds to prevent pressure on a wound and/or to immobilize a wound in providing an adequate healing environment. Wound bandages can serve many useful purposes in management of open or surgically created wounds. They are commonly used to protect skin incisions from the environment and from patient self-trauma. In addition, bandages when properly applied can reduce pain and swelling following some types of surgery.

In managing open wounds, bandages create a favorable environment for wound healing and encourage the natural biologic priority of wound healing. Bandages protect the

wound from further contamination, decrease edema, hemorrhage and dead space within the wound, and absorb wound secretions. Bandages increase the local wound temperature, humidity and promotes an acid environment which increases oxygen dissociation from hemoglobin thus increasing oxygen availability in wounds. Along with different topical medications, there is a continued pursuit of different bandage materials and their potential beneficial effects on wound healing. It should be emphasized that biologic wound healing encompasses the tenets of wound care including, cleanliness, treatment of contaminated wounds as open wounds, adequate surgical debridement, reconstructive techniques when indicated, and adequate drainage.

Bandages typically consist of 3 layers:

- Primary layer (contact layer)
- Intermediate (secondary layer)
- Outer (tertiary layer)

Bandages used for protection and support during travelling and training in equines can be classified into four types:

- Travelling Bandages and Boots
- Leg Shields, Shin Guards, Fetlock and Bumper Boots
- Work Bandages
- Support Bandages

Lecture-21

First aid in orthopedic patients. *By Dr. Amit Kumar, Department of Veterinary Surgery & Radiology, DGCN COVAS CSK HPKV Palampur. HP*

Veterinary orthopedic patient means animals suffering from disorder of musculoskeletal system e.g fracture, dislocation, sprain or lameness. First aid plays a very important role in favourable outcome of orthopedic disease. Vehicular accident, fighting and fall from height are major causes of orthopedic injury in animals. Orthopedic injury was always accompanied by soft tissue injury, injury to blood vessels/nerves, functional abnormalities and other associated disorders. First and foremost challenge in orthopedic patient is to protect the affected part from further damage as there is presence of sharp bone fragments at the fracture site. Other complication is to control the haemorrhage and protect wound site from infection in case there is open fracture or dislocation. Care should be taken while transporting the affected animal to hospital or referral centre. Large animals especially bovine and equine become recumbent after fracture of long bones and should be transported in a organized manner so that affected limb should not at any time come under the body of the animal. Adequate padding of the vehicle must be done to ensure safe and stress free transportation of the animal.

Identification of fracture:

- Twisted or distorted limbs, or in the case of a compound fracture, bone fragments sticking through the skin.
- Less apparent breaks cause great pain and discomfort.
- The animal will cry or bite when the affected area is touched; will lie around, often on the affected area; and will usually not walk, although in some cases it will walk despite the break.

- Affected limb does not bear weight. Swelling of the affected area within 24 hours of injury can be expected from any sort of fracture.

First aid in fracture and dislocations:

- Immediate administration of pain killer orally or systemically to prevent neurogenic shock
- Apply an ice pack or cold wet compress to the affected area; change regularly.
- Dressing of the wound in case there is open fracture or dislocation
- Splinting of the long bone if possible e.g. metacarpal, metatarsal and radius/ulna in large animals and bones of forelimb and hind limb in case of canine.
- Protect the animal from further injury by confining it to a small room.

Identification of Sprains:

- Sprains usually occur in the joints of an animal's limbs, causing rapid swelling.
- The affected area will be hot to the touch.
- The animal will not walk normally, if it walks at all.

First aid in Sprains

- Apply cold compresses or ice packs gently to the swollen area; keep the area cool for a day or two, changing the compress or ice when necessary.
- Wrap the affected area snugly with cloth, gauze, or athletic bandages; secure the wrapping to be sure the animal does not scratch or bite it off.
- Keep the animal quiet; discourage activity; avoid stairs.
- For sprains that heal and reoccur, apply hot towels or compresses; keep the injured area moist and warm for several days.
- If a sprain does not heal, or pain and swelling continue or are severe, see a veterinarian.

Lecture-22

Restraint techniques in domestic animals *By Dr Arvind Sharma, DGCN College of Veterinary & Animal Sciences CSK HPKV Palampur.*

Proper restraint of animals is very important for clinical examination and for carrying out various diagnostic and treatment maneuvers. Application of appropriate restraint technique helps in avoidance of injuries to the handlers and treatment of the animal without resorting to chemical methods of sedation which have side effects on the animal physiology and metabolism. Weak animals must not be subjected to vigorous methods of restraint. The choice of method of restraint depends on the species involved, site of injury to be treated, health status of the animal and temperament of the animal.

Restraint of cows & buffaloes



Simple methods of restraint are used for carrying out minor examination and treatment procedures. These simple procedures can be carried out by the farmers at their doorsteps also. These procedures are:

1. **Tail restraint:** The tail is held with both hands from its base and raised upwards. The handler should stand to one side to avoid injury due to kicking by the cow.

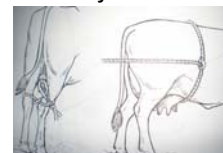
2. **Manual restraint of the head:** The nasal septum is firmly grasped with the thumb and fore finger with one hand and horn or ear with the other.

3. **Ear twitch:** A loop is formed around the horns and the rope is carried around the ear and the end of the rope is passed under the standing part to form a loop. The end of the rope is then pulled to apply restraint.



4. **Milking restraint:** A metre long rope is tied to the hind limbs above the hock joints in the form of a figure of "8" by crossing the ends.

5. **Squeeze restraint:** A loop is formed around the animal's body in front of the udder/ prepuce with a rope having an eye at one end. The end of the rope is pulled tight so that the rope squeezes the animal.

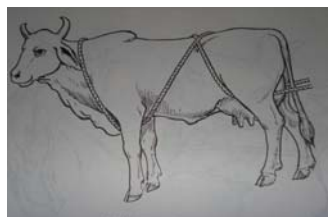


6. **Raising a foreleg:** The leg can be raised in case the animal is docile. A loop is formed around the pastern and the other end of the rope is passed over the withers and is held by an assistant

7. **Raising a hind leg:** The hind limb can also be raised manually. The leg is grasped around the pastern with the left hand with the pushing of the flank by the handler's shoulder so as to shift the weight of the animal to the other leg. At this time the leg is raised and the position of the limb is so adjusted so as to hold its weight on the handler's leg.



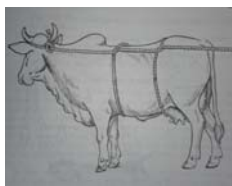
8. **Temporary rope halter:** A knot is placed around the animal's neck and then the end is passed through the loop over the nose. The end is pulled tight over the nose to restrain the animal.



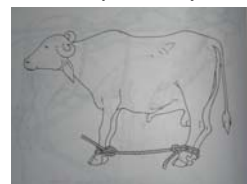
9. **Casting restraint (Burley's method):** A 12-15 metre rope is doubled and the centre is placed over the withers of the animals. The ends of the rope are carried between the forelimbs and crossed at the sternum. One end is carried up each side of the animal's body and the ends are again crossed over the back. The ends are now passed between the medial surfaces of the rear legs. The ends of the rope are pulled to cast the animal. The tail is pulled inside the leg and is held at the flank region. The

hand is held firmly and the hind and fore legs are tied separately to avoid any pressure on the thorax and injury to the leg.

10.Rope squeeze method: A loop is made around the animal's leg or horns using a knot. The free end of the rope is thrown over the back to the opposite side. The end is picked up and brought around the body and under the standing part of the rope to form a loop just behind the shoulder. Another loop is formed by tossing the end of the rope over the animal's back in front of the udder / prepuce. The rope is pulled to force the animal to lie down (Fig. 9). The hind and fore limbs are then tied separately.



11.Casting a buffalo: A rope 10 metres long is taken. One end of the rope is tied in '8' fashion at the level just above the fetlocks of forelimbs. Then the other end is taken behind the hind limbs and similarly the hind limbs above the fetlocks are tied with the free end is passed towards the side opposite to the recumbency the animal is to be casted. Soft bedding is a must to prevent injury to the animal.



13.Restraint of a calf: The handler passes one hand over the neck and the other hand on the front side of hind leg. The calf is then cast down to the ground. The hind limbs are tied by passing the rope over them. Both ends of the rope are pulled down from medial side of the corresponding leg and taken between the front legs. One end of the rope is taken over each side of the neck and tied at the head level.



Restraint of the horse

1.Twitch: A twitch is usually a loop of rope fastened in the hole of a stick. The twitch can be put around the ear or upper lip and is twisted to divert the attention of the horse from the pain on other parts of the body.



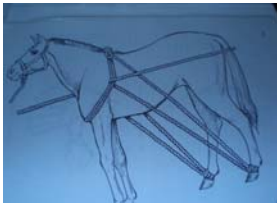
2.Halters: They can be temporary or permanent. A temporary halter can be put with the help of the rope the animal is tied. A rope is tied around the neck and a loop is passed around the animal's nose.

3.Raising the foreleg: The limb is raised for examination of the hoof or palpation of any part, with a hand or a rope. The handler stands by the side of the leg as close as possible to the animal with face towards the hind quarter of the animal. The limb is held at pattern and raised.

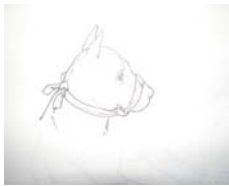
While using a rope, the rope is tied at the pastern and the other end is passed over the withers. It may be tied around the opposite elbow or end is taken around the neck and is passed under the rope going over the withers. The rope is pulled to raise the limb.



4.Casting of the horse (Double side line method): An 18-20 metres cotton rope is doubled and in a figure of '8' tied around the neck. The two free ends are passed between the fore and hinds limbs and then looping around the pasterns and taking the ends forwards from the outer aspects and looping then on the loop around the neck. The n the ends are pulled in opposite direction to make the horse fall down with the head restraint directing the direction of the fall. After the fall the upper fore and hind limbs are tied first and then the lower legs .



Restraint of Dog:



Muzzle tape: A 80cm long cotton bandage is looped around the muzzle with a knot. The loop is slipped over the nose half way upto the corner of the mouth and is drawn tight. The ends of the bandage are brought around the sides of the neck to tie them near the back of the head .

2.Carrying an injured puppy: the right hand is passed under the body of the dog with the index finger passing between the forelimbs holding the dog's chest after application of temporary muzzle. The left hand is passed over the withers and the neck is held steady to avoid any bite .The body of the dog should rest on the right hip of the handler.

3.Carrying a large injured dog: A temporary muzzle is applied to the dog. The handler should kneel down and place his right arm under the neck region keeping the palm against the chest. The rear side of the dog is held by the other hand.



4.Restraint for giving liquid medicine: The loose skin at the lips at the corner of the dog's mouth is pulled out and the liquid is poured from a spoon or small metal container into the space between the lips and the teeth. The liquid can be given to the dog even after application of temporary muzzle.



5.Restraint of dog on the table: A temporary muzzle is applied. The dog is put on the table and the forelimbs are held with one hand and the hind limbs with the other. The fore fingers are put between the limbs to have a strong grip. A gentle pressure is applied on the neck with one arm and the arm should lean on the hind limbs to hold them down.



Routes of Drug Administration *By Dr. Dinesh Sharma, Ekta Sharma & C.Varshneya, Deptt. of Pharmacology & Toxicology, COVAS, CSKHPKV, PALAMPUR.*

Most of drugs can be administered by variety of routes. The choice of appropriate route in given situation depends both on drugs as well as patient related factors.

Routes of drug administration can be classified into:

1. Oral

2. Parenteral

3. Inhalation

4. Topical

1. Oral: oral ingestion is the oldest and most common mode of the drug administration. It is safer, more convenient, does not need assistance, non- invasive, often painless, medicament not need to be sterile, cost effective (cheaper). Both solid dosage forms (eg. Powders, tablets, capsules,) and liquids doses forms (eg. Elixiers , syrups , emulsions , mixtures etc.) can be given orally.

2. Parenteral : This refers to administration by injection which takes the drugs directly into the tissue, fluids or blood without having to cross the intestinal mucosa.

Advantages: Action is faster and sure, gastric irritation and vomation are not provoked, it can be employed even in unconscious, uncooperative or vomiting patient, there is no chance of interference by food or digestive juices .

Disadvantages: preparation has to be sterilized, so costlier, technique is invasive and painful, assistance of another person is generally needed, there is chance of local tissue injury and so it can be comparatively risky.

The important parenteral routes are :

a) Intravenous : here the drug is injected as a bolus as infusion directly in one of the superficial veins. The drug directly reaches into the blood stream and effects are produced immediately.

b) Intramuscular route : Here, the drug is injected between the layers of one of the large skeletal muscles – deltoids , triceps , gluteus maximus , rectus femourus etc. muscles is less richly supplied with sensory nerves so mild irritant drugs can be given .

c) Subcutaneous route :The drug is deposed into the loose s/c tissue which is highly supplied by nerves (so irritant drugs can not be injected) but is less vascular (absorption is slower)

d) Intradermal route: The drug is injected into the epidermis. Uses for specific purposes only (for vaccination, hypersensitivity testing)

e) Epidural route: Here the drug is injected into the epidural space. Commonly used in vety. Practice to produce epidural anesthesia in large animals.

3. Inhalation route: Volatile liquids and gases are given by inhalation for systemic action. For this, special equipment/apparatus is required. Not a convenient and routine method for domestic animals.

4. Topical/local administration: Here, the drug is applied to body surfaces like skin and mucus membranes. generally used where local action is desired. The drug can be applied as ointment, cream, lotion, paste, powder, dressing, spray, dip etc.

Lecture-24

Some common pharmaceutical preparations *By Dr. Dinesh Sharma, Ekta Sharma & C.Varshneya, Deptt. of Pharmacology & Toxicology, COVAS, CSKHPKV, PALAMPUR*

Magnesium Sulfate mixture

Synonym: Mistura alba, alba mixture

Magnesium Sulfate: 2g.

Magnesium carbonate: 1g.

Menthol crystal: 1-2.

Distilled water: 30ml.

Therapeutic uses:

It is used in indigestion, hyperacidity and tympany.

Magnesium hydroxide mixture

Synonym: Milk of magnesia.

Magnesium Sulfate: 4.75g.

Sodium hydroxide: 1.5g.

Chloroform: 2.5ml.

Distilled water: up to 100ml.

Therapeutic uses:

It is used in indigestion and hyperacidity.

Aqueous solution of iodine

Synonym: Lugol's iodine.

Iodine: 5g.

Potassium iodide: 10g.

Distilled water: up to 100ml.

Therapeutic uses:

It is used as counter-irritant and in ring worm and mange infection.

Potassium permanganate lotion

Synonym: Condy's lotion.

Potassium permanganate: 1g.

Distilled water: up to 100ml.

Therapeutic uses:

It is used to clean wounds and abscess.

Boric acid lotion

Synonym: Lotio acidi borici.

Boric acid: 1g.

Distilled water: up to 100ml.

Therapeutic uses:

Salicylic acid lotion

Salicylic acid: 2g.

Castor oil: 1ml.

Alcohol: up to 100ml.

Therapeutic uses:

It is used in conjunctivitis, stomatitis, gingivitis, urethritis, vaginitis, cystitis and as a wash for irritated mucous membrane. It is used as keratolytic.

Strong solution of Iodine

Synonym: Tincture iodi fortis

Iodine: 10g.

Potassium iodide: 9g.

Distilled water: 10ml.

Alcohol: up to 100ml.

Therapeutic uses:

It is used as counter-irritant and in ring worm and mange infection.

Lecture-25

Some common plant toxicities in Himachal Pradesh *By Dr. Dinesh Sharma, Ekta Sharma & C.Varshneya, Deptt. of Pharmacology & Toxicology, COVAS, CSKHPKV, PALAMPUR*

LANTANA POISONING

**BRACKEN FERN
POISONING**

SORGHUM POISONING

Lantana camera (Lal phulnoo)

Toxic part: Leaves of the plant.

Signs: Cholestasis and photosensitization

Treatment: Prevent further intake

Use of activated charcoal

Use of purgatives

Rumenotomy.

Pteridium aquilinum.

Toxic part: Immature green plant is more toxic

Signs: Aplastic anemia

Haematuria

Bright blindness

Hypovitaminosis- B1

Treatment: Inj. of thiamine

Sorghastrum notions (Indian grass)

Toxic part: Young shoot and leaves.

Signs: Cerebral anoxia and convulsions.

Treatment: Injection of mixture of sodium nitrite and sodium thiosulphate by IV.

AGERATUM POISONING

Ageratum conyzoides (neela phulnu) *Ageratum houstonicum*.

Toxic part: Fresh green leaves and stem.

Signs: Haemorrhagic and photosensitization syndrome.

Treatment: No specific antidote.

Combination of 5% DS & liver extract.

OHI POISONING

Albizia stipulate.

Toxic part: Young shoot leaves.

Signs: Dyspnoea and oligourea.

Treatment: No specific antidote.

Combination of DS & liver extract.

OAK POISONING

Quercus incana (Bun poisoning)

Toxic part: Leaves of young buds.

Signs: Ventral oedema and abdominal pain.

Treatment: Calcium hydroxide (15% of ration)

Lecture-26

Commonly used Compounded prescriptions in Animal Treatment By Dr. Dinesh Sharma, Ekta Sharma & C.Varshneya, Deptt. of Pharmacology & Toxicology, COVAS, CSKHPKV, PALAMPUR

Mixture for acute indigestion	Mixture for simple indigestion	Carminative mixture
For a cattle,	For a cattle,	For a cattle
R/	R/	R/
Oil turpentine: 25ml	Mag.sulph: 250g	Pulv. Ajwain: 15g
Spt. Ammon .Aromat: 45ml	Sodi.chlor: 130g	Pulv.anisi;15g
Oil linseed: 500ml	Pulv.ginger; 30g	Black pepper:0.5g
Drench at once Carefully	Sodi.bicarb; 30g	Black salt:50g
	Water: 600ml	Pulv.ginger: 15g. Mix with water and drench twice daily
	To be given immediately.	

Laxative mixture

For a cattle

R/

Mag.sulph: 150g

Sodi.chlor: 60g

Pulv.ginger; 16g

Sodi.Sulph; 60g

Water: 750ml

Drench at once.

Astringent powder (For non-specific diarrhoea)

For a cattle

R/

Pulv.catechu: 4g

Creta :15g

Kaolin: 10g

Pulv.opium: 4g

Electuary: twice daily.

For a cattle

R/

Pulv.gention : 15g

Pulv.nux vomica: 1g

Sodi.carb: 15g

Pulv.ginger;15g

Pulv.chirata ; 15 g

Expectorant mixture

For a cattle

R/

Ammon.chloride: 8g

Pot.iodide: 8g

Pulv .anisi: 30g

Treacle : qs

Electuary ; twice daily.

Haematinic mixture

For a horse

R/

Ferri. Sulph. Exci: 5g

Copper sulph : 200mg.

Cobalt sulph: 200mg.

Treacle : qs

Electuary ; once daily for 10 days

Urinary antiseptic

For a cattle

R/

Hexamine : 4g

Sod. Acid phos : 30g

Treacle: qs

Electuary ; to be given at once.

Lecture-27

Role of a clinical biochemistry laboratory in disease diagnosis *By Dr. Geetanjali Singh, Dr. Naresh Kumar & Dr. Ashutosh Tiwari, Department of Veterinary Biochemistry, DGCN COVAS CSK HPKV, Palampur*

Many domestic animals are reared by farmers for getting milk, meat, eggs, wool, and daft work. These animals fall sick due to natural causes and also due to bad management such as poor quality feed and fodder, unclean housing, contact with sick animals etc.

If sick animals are not treated in time, their milk, eggs, meat and wool production decrease. The working animals lose their capacity to work. In many cases the animals die.

All these situations lead to economic loss to the farmer in terms of loss of production, money spent on treatment and loss of animal in case of death.

When a sick animal is brought to a veterinary hospital, the Vet takes the case history or information about the sick animal from its owner. Thereafter the veterinarian examines the animal carefully for some parameters (such as temperature, pulse, breathing, dung quality, movement, feeding pattern and behavior etc.). Most of these sicknesses are diagnosed to some extent from the case history and certain parameters checked during the clinical examination.

However, many times these parameters are not sufficient for a proper diagnosis. When a diagnosis is not made correctly, the treatment may not work and animal continues to remain sick. Therefore, quick and correct diagnosis is very important for the treatment and control of animal diseases. For this, sometimes the veterinarian collects blood sample, urine, saliva and skin scraps etc. for making a more accurate diagnosis. These samples cannot be collected by an ordinary person unless he is knowledgeable about it because, these samples are collected skillfully from a particular location on the animal body, using proper instruments, in proper amounts, and in clean or sterilized containers. Sometimes suitable amounts of certain chemicals need to be added to keep the sample fit for testing in a laboratory. If the laboratory is far away from where the samples are collected, then it is important that these are stored properly, preferably in a refrigerator and transported in ice as early as possible; otherwise the sample gets spoiled and gives wrong results.

These body fluids (blood, urine, milk etc.) from diseased animals have certain biochemicals whose presence, absence, or their level is indicative of a disease. For example high sugar in blood even when animal is fasted (not taken food for 12 hours) is indicative of diabetes. Similarly excessive detection of some particular enzymes in blood is indicative of a liver disease. Detection of excessive urea in blood tells about a possible disease of kidney. Decrease in total protein may be due to liver failure, low absorption of protein from gut or poor feeding of animal. Similarly particular enzymes in blood increase when heart, pancreas or muscles are damaged. Excessive cholesterol indicates a possibility of heart disease. Cows with a young calf and producing large quantity of milk may suffer from a disease known as 'Ketosis'. In this disease the level of a group of biochemical substances called 'Ketone bodies' becomes high in blood. This disease can be diagnosed by a simple test on a urine sample. A number of other tests are also performed on the urine samples. For example presence of blood in urine may be indicative of injury to urinary tract. Presence of protein in urine tells about kidney disease. Presence of sugar in urine tells about possibility of diabetes. Hence, we can see that biochemical tests on blood, urine or other body fluids can help in easy and confirmed diagnosis of many diseases.

Another branch of clinical biochemistry performs tests on blood only. This study is called hematology. In these tests, blood hemoglobin, the number of white blood cells, red blood cells and platelets are counted. The number and type of white blood cells, abnormality in red blood cells and blood clotting time etc. is determined. This information is also helpful in diagnosing various infectious, allergic and deficiency diseases.

Many conditions can be diagnosed by measuring the level of certain mineral elements in blood. You might have come across a situation where a high milk yielder cow becomes very sick soon after giving birth to a calf and cannot even get up. Usually the

animal suffers from “Milk Fever” but it is important to confirm the diagnosis before giving the treatment. This disease is confirmed by measuring the level of calcium in blood. These are just a few examples. Many other special tests can be done such as for detecting amount of minerals, hormones, toxic substances and antibodies etc. in blood, urine, milk or other fluids.

Thus, for the diagnosis of a number of diseases, a good clinical biochemistry laboratory is very useful. In a biochemistry laboratory, samples of blood, urine, milk, saliva etc. are processed in a suitable manner and the abnormal bio-chemicals are detected with the help of chemical reactions using various types of instruments. Once the report of blood, urine or any other body sample is determined, it is sent to the attending veterinary doctor for making a correct diagnosis of the disease. Once a correct diagnosis is made, it is easy for the doctor to prescribe suitable medicine to the animal. As a result, animal gets cured faster when the doctor has more information about the disease as compared to when no laboratory tests are done. These tests can be done on all types of animals such as cows, buffaloes, horses, mules, dogs, poultry, pigs, sheep and goats. Therefore, farmers should be educated about the importance and necessity of blood tests when a sick animal is treated in a hospital. It is important to remember that these tests can be performed by trained persons only in a laboratory.

Lecture-28

General introduction to laboratory equipments & glassware *By Dr. Madan Verma,*

Department of Veterinary Physiology, DGCN, COVAS,

CSK HPKV Palampur. HP

A laboratory can be attached to the hospital/ clinics or it can be an independent setup. The main aim of laboratory is to provide special diagnostic services. Before working in a laboratory one must be acquainted with the working of different types of equipments used in the laboratory. He/She also needs to be trained in handling of these equipments especially the glassware, which needs extra care. The person working in the laboratory should be well aware of the different uses of equipments and glassware and their maintenance. It becomes imperative for every person working in a laboratory to know the safety regulations and follow these strictly.

Basic requirements of clinical laboratory

- Good quantity of microscope (Binocular).
- Spectrophotometer and its accessories (cuvettes, filters etc.)
- Centrifuge with accessories (centrifuge tubes), Water bath, Balance –physical and chemical
- Distillation set, Hot air oven, Rotary microtome, Microtome knives
- Water bath for section cutting (electric paraffin bath), Autoclave
- Inoculation chamber or laminar flow for bacteriological work
- Inoculating needle or platinum wire with holder
- Gas cylinder with burners
- Microhematocrit centrifuge & microhematocrit reader

- Refrigerator and Deep freezer
- Incubator, Thermometer
- Hemocytometers, Hemoglobinometers
- Microhematocrit capillaries (Plain or Heparinized), Sealing clay
- RBC and WBC diluting pipettes
- ESR tubes (Wintrobe tubes) and racks
- Test tube racks
- Watch glasses
- Microscope slides, cover slips and cavity slides for serological studies
- Glassware and plastic ware- measuring cylinders (500, 250, 100, 50 ml), dropping bottles, breaks, narrow mouth reagent bottles, petri dishes, immersion oil vials, collection vials for serum/blood (30,20,15,5,2 ml), funnels, specimen jars, test tubes, centrifuge tubes, reagent bottles, coupling jars(horizontal and vertical)
- Pipette washer and pipette holder
- Shelves for keeping reagents
- Stains and reagents and bacteriological media as per the equipments
- Suppliers –filter paper, lead pencil, diamond pencil, laboratory record book, cotton gauge, absorbent and non-absorbent cotton packs, swabs, syringes and needles etc.

Safety regulation in clinical laboratory practice

Before working in a clinical laboratory, one must be acquainted with the safety regulations of the laboratory. All laboratory personnel and particularly the office/scientist in charge of the laboratory must be aware of the common laboratory accidents. They should understand that laboratory safety regulations of the laboratory are not only for their own protection but also for the safety of their fellow workers. The single most important cause of any accident is carelessness which can arise from either a lack of knowledge or overconfidence.

A few of the major tips to avoid accidents are as follows:

- Handle glass with care
- Avoid inhaling gases
- Protect your eyes while handling fumes
- Do not eat or drink in the laboratory
- In case of contact with a chemical reagent, wash the affected area promptly with water.
- Follow prescribed methods of heating and mixing
- Never pipette by mouth. Use various automated devices or rubber bulbs
- Always wear a protective covering over the dress (Coat, apron or gown).
- Broken glassware on the floor must be cleaned immediately and discard should be put in a separate container so that it can be handled separately.
- All flammable chemicals (e.g. ether, acetone, alcohol, xylol) must be marked with red ink.
- Never store Ether and similar flammable chemicals in the refrigerator as this could lead to explosion. Store flammable chemicals in metal containers
- Do not touch chemicals with hands. Always wear rubber gloves to avoid contact with poisonous/ corrosive chemicals.

- Dispose off chemicals only by recommended procedures. Most chemicals, except solutions with cyanide are discarded during and after use in to the sink followed by a sufficient amount of running water. Trapped acid in the sink may produce dangerous toxic gas (hydrogen cyanide).
- Turn off the flame before leaving in the laboratory. Work with the flame under a hood. Never keep an open flame near flammable liquids.
- Do not throw burning matches into a waste basket.
- All laboratory personnel must know the location of the fire extinguisher
- During specimen collection prevent self-injury. Wash hands thoroughly after the collection of specimen. Label the specimen clearly if it is suspected to contain dangerous organism. The outside of the container should be wiped clean with alcohol swab.
- Wear disposable gloves while removing the specimens from transport bags and work inside a safety hood.
- The infectious material from the microbiology laboratory should be discarded only after autoclaving it for 30 minutes at 121⁰C
- During centrifugation with infectious materials always close the lid. The use of plastic centrifuge tubes is recommended. If there is a breakage of a glass centrifuge tube during spinning, stop the centrifuge remove the fluids and broken glassware (wear rubber gloves), clean with a disinfectant and if possible remove the cups that hold the centrifuge tubes and soak them in phenol water for two hours before replacing
- Soon after dealing with the infectious material, disinfect your hands carefully before using towel
- Specimens from suspected tuberculosis cases must be autoclaved for 40 minutes along with container before discarding the material
- At the end of day, put all reagents back on the shelf, clean up the work area thoroughly disinfect the work bench, leave the apron inside the laboratory and wash hands with phenolic soap.

Lecture-29

Recording of rectal temperature, respiration rate, heart rate and pulse rate in domestic animals. *By Dr. Madan Verma, Department of Veterinary Physiology, DGCN, COVAS, CSK HPKV Palampur. HP*

Rectal Temperature: It is the body temperature as measured by a rectal thermometer which has been in situ and in contact with the mucosa of the rectum with the anal sphincter tightly closed for at least 2-3 minutes. It is the most common method of recording body temperature in animals.

Procedure:

- Give adequate rest to the animal under shade before recording temperature.
- Restrain the animal properly.
- Use a large-animal rectal thermometer (glass or digital).
- Apply petroleum jelly or a similar lubricant to the tip of the thermometer.
- Shake the thermometer down (only for mercury thermometer).
- Insert the thermometer three-quarters of the way into the animal's rectum.

- Hold the thermometer in position in a way that its tip is in contact with the rectal mucosa. Wait 2 to 3 minutes.
- Take the thermometer out, wipe with cotton and read it.

Respiration Rate: The respiratory mechanism/respiration rate is divided into two parts.

(A) Inspiration and (B) Expiration.

The rate and the amplitude of the respiratory movement in the different animals can be recorded by the use of following methods.

Physical methods:

- **Paper method:** The respiration rate of animals can be recorded by placing a paper strip close to the nostrils. The paper will move towards the nostrils during inspiration and pushed away during expiration. The pull and push of the paper will constitute one respiration. To record the respiration rate count the number of times the paper is pushed per minute.
- **Abdominal method/Flank method:** The respiration rate in the animal is mostly recorded by standing at the back of the animal and making the observations on the rise and fall of the abdominal flank (Differentiate it from the rise and fall of the left abdominal flank at the time of ruminal contraction). The respiration rate of the animal will be the number of times the flank rises per minute.

Precautions: Always stand at the back of the animal and observe the fall and rise of the flank unnoticed by the animal otherwise the animal once disturbed will not give the normal respiration rate as during disturbance the respiration rate gets increased.

3. Auscultation method: The respiration rate is recorded by placing a stethoscope over the chest and recording the respiratory sounds during inspiration and expiration.

Determination of Heart Rate/Pulse Rate/Cardiac Sounds:

Heart rate is the number of times the heart beats per minute. The heart rate can be determined by using either of these methods i.e. by auscultation, by palpation, by E.C.G. or by heart rate meter.

Auscultation method: For the record of the heart rate/minute, place a stethoscope on the left side of the chest/thorax on the 4th/5th intercostal space and record the cardiac sounds i.e. lub and dub. The lub and dub forms one heart beat or count the total number of sounds per minute and divide them by two to get heart beat/heart rate per minute.

Palpation method: For recording the pulse. In cattle, the record of pulse is made from the coccygeal artery; dogs- femoral artery; man- radial artery.