

## A Guidebook for Animal Science and Veterinary Medical Students; Question and Answer Discussion for Public Service Commission Examination

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### Abstract

Livestock plays an important role in the livelihoods of people especially in the developing countries. They provide healthier food, work opportunity, economic, social status, and ensure environmental sustainability. But livestock sector is facing challenges due to increasing global population, changing livestock production systems, environmental variation, old technologies and institutions policies. As crops and livestock rearing in rural areas directly affects food security condition of the nations. Thus, there is need to aware peoples in order to solve these issues and get maximum production from domestic animals in future. Due to lack of exams experience and current information, veterinary graduates cannot get success in the commission exams. Therefore, our aim was to provide a guidebook for animal science and veterinary medical students; question and answer discussion for the public service commission examination which may open various complication related to exams. This book may help students to better understand examination planning, examination scope, examination technique and timeliness which, in turn, may build students interest to play their role as veterinary doctor in livestock sector.

**Keywords:** Livestock; Food Safety; Veterinary Students; Commission Exams

### Introduction

Livestock production plays a significant role in the life of farmers in the developing countries [1]. Livestock produces about 30% of agricultural gross domestic product (AGDP) in the developing world, and about 40% of the global GDP [2]. But growing global populations and increasing urbanization, has raised the demand for easily cooked nutritious food, and rising incomes allowed people to express their food preferences, and interestingly, the demand for livestock products is the fastest growing agricultural market, especially for the products in which smallholders can be competitive [3]. There is no way to reach the goal of doubling of food production by 2050 without making livestock production more efficient, but this must be achieved at the same time by reducing the negative impacts of livestock products on environment, food safety and human health [4,5]. In countries such as Pakistan, China, India, Nigeria, South Africa and Uganda, there are doubts about the capacities of their animal industries in order to rapidly increase demand for foods animal [6,7]. Food insecurity is a serious issue of the developing nations all over the world. Almost 870 million people (12.5% of the global population) are food insecure while approximately 13.9% of the total Asians also fall in this category [5]. Moreover, 17.6% of the South Asian population is living below food insecurity line [3]. There are a number of threats to food security such as increased population growth, decreased food production, increased poverty, political instability, market condition, natural disaster, climate change, reduced water availability, brief rainy seasons,

increased prices of inputs, distorting agricultural development policies, and sometime natural hazards etc [3,7,8]. Hence, there is need to solve these problems carefully if we want to get maximum production from livestock in the future [9]. Due to lack of sufficient and current information, veterinary students cannot pass the commission exams. Therefore, our aim was to provide a guidebook for animal science and veterinary medical students; question and answer discussion for public service commission examination which may help veterinary and animal science students to better understand commission paper pattern, interview question and answer discussion in order to understand better way of communication. This may encourage students how to better prepared for examination and build their interest to play a role as a veterinary doctor to draw the attention of their study and research to the issues concerning the contribution of livestock to the social and economic progress of the developing communities which may attract both public and private sector investments in this sector which, in turn, may reduce the poverty facing the developing community.

### **Livestock management**

#### **How would you improve livestock production as veterinary officer (V.O)?**

- By Building Semen Production Unit (SPU) in specific areas where livestock population is high
- By Keeping registered animal or Proven bull in specific areas
- By selecting genetically potential animal
- By selection of good animals.

#### **What do you know about Poultry industry in Pakistan?**

Poultry sector is one of the most organized branches of the agro based sector of Pakistan. Its growth rate is 10-12% per annum. At present over 190 billion rupees worth of agriculture product and by products is being used in poultry feeds.

#### **What do you know about Poultry shares in gross domestic production (GDP) and in the Livestock?**

- Poultry Sector has contributed 1.3 percent in GDP during 2013-14 while it's contribution in agriculture and livestock at 6.1% and 10.8% respectively.
- Poultry meat contributes 28.0% of the total meat production in the country (Pakistan). Poultry industry is more than 200 billion Rupees (RS). Poultry sector has shown a robust growth @ 8 - 10 percent annually which reflects its inherent potential.

### **Define GDP**

Gross domestic product (GDP) is a monetary measure of the value of all final goods and services produced in a period (quarterly or yearly). Nominal GDP estimates are commonly used to determine the economic performance of a whole country or region, and to make international comparisons.

#### **What is rural sociology (RS) provide some information**

RS is a professional and scientific study of rural society. The Society seeks to enhance the quality of *rural* life, communities, and the environment. It addresses how communities and areas with few people are socially and economically organized.

#### **Animal seems healthy but not feeding roughages; Diagnosis Please**

- Several factors;
- But possibility of pain in teeth;
- Stomatitis (inflamed oral cavity).

#### **Describe techniques for handling of animals**

- By calling their names
- By hand striping on back of animals

**As a veterinary officer if you visit to a restaurant how will you differentiate B/W goat and dog cooked meat?**

By observing hoof; Hoof are cloven footed in goat and digits are present in dog.

**Cattle breed in Pakistan**

- Sahiwal
- Red sindhi
- Dhanni
- Rajistani
- Tharparkar
- Kankraj
- Cholistani

**Buffalo breed in pakistan**

- Nili
- Ravi
- Nili-Ravi
- Kundi
- Azikhali

**Goat breed in pakistan**

- Beetal
- Dira din panah (DDP)
- Nachi
- Teddy
- Kohai ghizer
- Baltastani
- Barbari
- Kajli

**Sheep breed in Pakistan**

- Damani
- Dumbi
- Kajli
- Harnai
- Balochi
- Baltastani
- Bhagdale
- Kohai ghizer
- Hissardale

### Horse breed in Pakistan

- Anmol
- Morna
- Shian
- Hirzai
- Waziri
- Pak through breed
- Kajlan

### Camel breed in Pakistan

- Anmol
- Morna
- Shian
- Hirzai
- Waziri
- Pak thorough breed

### Define udder edema

- In udder edema, there is an accumulation of fluid in the udder. Accumulation begins at the base of the udder and, in mild cases, may be present around only one or two quarters. As the severity of the edema increases, the entire udder becomes affected and fluid may spread through the abdominal area, the thighs and vulva.
- There is no single cause of udder edema. Normal metabolic changes, genetics and nutrition likely all play a role.

### Reasons

There is a drop in blood proteins as the cow transfers immunoglobulins (proteins) to colostrum. This is thought to increase the permeability of the blood vessels allowing an increase in fluid buildup.

Changes in hormone levels are also believed to play a role in udder edema.

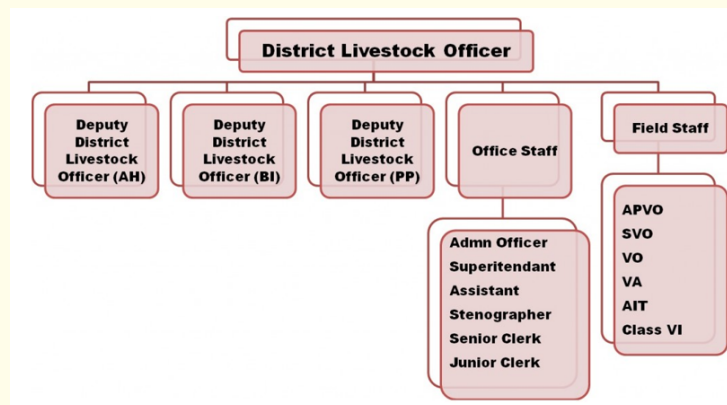


Figure 1: Organogram.

Cattle	Buffalo	Sheep	Goats	Horses	Asses	Mules	Rural Poultry	C.Poultry	Camels
6,44,567	2,19,556	11,18,659	15,31,687	5,764	55,962	1,047	4,24,308	14,52,076	23,007
<b>Estimated Population up to 2013-14 (Growth Rate 5 % per Annum)</b>									
8,12,156	2,76,639	14,09,508	19,29,928	7,264	70,509	1,319	5,34,290	18,29,616	28,987

**Table 1:** Livestock Population of Dera Ghazi Khan, Punjab, Pakistan.

### Population of livestock in Pakistan

Specie	Population (Million)
Cattle	39.70
Buffalo	34.60
Sheep	29.10
Goat	66.60
Camel	1.00
Total	171

**Table 2:** Economic survey in Pakistan (ESP) 2013-14.

Species	Milk Production (Billion Liters)	Human Milk Consumption (Billion Liters)
Cattle	18.027	14.421
Buffalo	31.252	25.001
Sheep	0.038	0.037
Goat	0.822	0.801
Camel	0.851	0.840
Total	50.990	41.133

**Total 3:** Milk Production in Pakistan ESP 2013-14.

## Section B

### Animal nutrition and feed sciences

#### Define nutrition

The sum of the processes by which an animal takes in and utilizes food substances.

#### Describe the principle of animal nutrition

The principles of animal nutrition deals with classification and function of nutrients, digestive processes, deficiency symptoms, characterization of feedstuffs, and formulation of diets for domestic animals.

#### What is Calf milk replacer (CMR); Describe CMR

A good-quality milk replacer should be similar in chemical composition to whole milk. It should contain the nutrients that calves can digest in the right proportions. Most milk replacers form a clot in the abomasum and thus provide a slow release of nutrients to the duodenum.

Constituents	Quantity
Ground maiz	46
Soyabean meal	17
Canola meal	11
Vegetable oil	3.5
Rice polish	13
Molasses	6.5
Mineral mixture and vitamin	1 +1
Lime (calcium)	1
Total	100

**Table 4:** Calf starter composition (% age).

Milk replacers are generally formulated from by-products of dairy processing, together with animal fats plus added vitamins and minerals. Considerations when selecting a suitable calf milk replacer such as CMR 9 and CMR 111 mainly of lactose (36 - 40% of DM), fat (30 - 40% of DM) and milk protein (28 - 32% of DM). The protein is principally made up of casein, but also includes the whey proteins, albumin and globulin.

Commercial milk replacers usually contain 20-24% protein. Young calves can only digest proteins of milk origin, such as from skim milk and buttermilk powders. Spray-dried milk powders, which manufacture at lower temperatures than roller-dried milk powders, are the preferred source of powder for milk replacers.

Milk replacers should contain 15 - 20% fat and the type of added fat used will influence its utilization by the calves.

Cows require at least 60 litres of water/head/day and may need 100 litres or more depending upon yield.

**Tell the name of short chain fatty acid or volatile fatty acid**

18 - 20% of VFAs produced is butyric acid. It provides energy to the rumen wall and is used in milk fat synthesis and for body fat, when excess energy is present in the diet. It doesn't vary in proportion to other volatile fatty acids, therefore has little influence in milk fat content.

Common	Systematic
	Formic acid
C2:0	Acetic acid
C3:0	Propionic acid
C4:0	Butyric acid
	Isobutyric acid
C5:0	Valeric acid
	Isovaleric acid

**Table 5:** short chain fatty acid.

**Who discovered the word vitamin; tell the name of that genius person?**

In 1912, Casimir Funk originally coined the term "vitamine".

### Define case fatality

Case fatality is the proportion of cases of a certain disease that actually dies due to the consequences of that disease (Death of animal among infected animals).

Attack rates are actually risks.

### Define some terminology

- **Colt:** A colt is a male horse, usually below the age of four years. The term “colt” only describes young male horses and is not to be confused with foal, which is a horse of either sex less than one year of age. Similarly, a yearling is a horse of either sex between the ages of one and two.
- **Filly:** A young female horse, especially one less than four years old.
- **Jelding:** A gelding is a castrated horse or other equine, such as a donkey or a mule.
- **Mare:** A female horse or pony that is 4 years or older.
- **Stallion:** A male horse or pony that is 4 years or older that has not been gelded (castrated). Stallions are also known as “Entire”.
- **Gelding:** A male horse or pony of any age that has been gelded (castrated).

### Describe rangelands and its types

Rangelands are grasslands, shrublands, woodlands, wetlands, and deserts that are grazed by domestic livestock or wild animals. Types of rangelands include tallgrass and shortgrass prairies, desert grasslands and shrublands, woodlands, savannas, chaparrals, steppes, and tundras. Rangelands are also managed principally with practices such as managed livestock grazing and prescribed fire rather than more intensive agricultural practices of seeding, irrigation, and the use of fertilizers.

### Per capita poultry meat and egg consumption in Pakistan

The local poultry industry is producing 11.2 billion table eggs and 1.34 billion kg of chicken meat annually. In Pakistan, per capita consumption of meat is only 7.4 kg and 60 - 65 eggs annually, whereas developed world is consuming 25 - 28 kg meat and over 250 eggs per capita per year. Pakistan produces 530 million birds annually. 50 billions of agricultural by product are used in poultry industry.

### What is per capita meat and mutton consumption in Pakistan?

Pakistan's goat meat consumption of 779,000 tons in 2011-12 ranks it among the top 3 in the world. 1.7 million tons of beef consumption in Pakistan is ranked 9th among beef consuming nations. In addition, 834,000 tons of poultry meat consumption puts it among world's top 20.

The per capita availability of milk was 150 litre and meat 19 kg per annum in 2000-01, which comes to 0.41 litre milk per day and 5.2 grams meat per day.

### What is a Foreign exchange earnings (FEEs)

FEEs refer to the monetary gain made by selling goods and services OR by exchanging currencies in global markets. Such markets are known as Foreign Exchange markets/ Forex markets.

An export is a function of international trade whereby goods produced in one country are shipped to another country for future sale or trade.

### Define poultry farming or production

Is the raising of domesticated birds such as chickens, ducks, turkeys and geese for the purpose of farming meat or eggs for food.

### **Define growth promoter**

Different categories of feed additives for farm animals are referred as natural growth promoters (NGPs) or non-antibiotic growth promoters. They are known as favorable alternatives to antibiotic growth promoters (AGPs) in livestock production.

### **Benefits**

The main advantage of NGPs over AGPs is that they usually do not bear any risk regarding bacterial resistance or undesired residues in animal products such as meat, milk or eggs. Addition of NGPs to feeds of farm animals may have a number of beneficial effects, including:

- Rapid development of a healthy gut microflora
- Stabilization of digestion
- Increased growth performance
- Stimulation and rapid maturation of the immune system
- Reduced incidence of diarrhea
- Improved feed efficiency
- Lower mortality rates
- Higher profitability

### **Describe acidifiers**

Acidifiers, such as organic acids or their salts, are used to prevent microbial degradation of raw materials or finished feeds, especially under poor storage conditions (e.g. high moisture content, high levels of contamination with molds). Moreover, acidifiers may improve growth performance through establishment of low gastrointestinal pH conditions which support endogenous digestive enzymes and reduce undesired gut microorganisms. Many dietary acidifiers are based on propionic acid, formic acid, lactic acid and others, either as single components or in combination. Some acidifiers also contain inorganic acids (e.g. phosphoric acid).

### **What is probiotics and its beneficial effects?**

#### **Define probiotics**

Probiotics are microorganisms that are believed to provide health benefits when consumed. Probiotics are viable microorganisms that are used as feed additives in monogastric animals. Probiotic bacteria (e.g. from the genera *Lactobacillus*, *Bifidobacterium*, *Enterococcus*).

#### **Why we used it or its benefits?**

- Competitive adhesion of probiotic microorganisms to epithelial receptors may prevent the attachment of pathogenic bacteria.
- Competition for nutrients between probiotic and undesired bacteria;
- Increased synthesis of lactic acid and reduction of intestinal pH;
- Production of specific antibacterial substances;
- Reduced production of toxic amines and decrease of ammonia level in the gastro-intestinal tract;
- Beneficial effects on the intestinal immune system,
- Improved intestinal defense against viral infections.

#### **What is prebiotics?**

Prebiotics are substances that induce the growth or activity of microorganisms Or Prebiotics are non-digestible carbohydrates that act as food for probiotics. It is based on the feeding of certain non-digestible oligosaccharides in order to control the microbial composition, thereby assisting to maintain a beneficial microflora. Prebiotics are carbohydrates which are indigestible for the host animal. They support a healthy gut microflora. These include fructose oligosaccharides (FOS) including inulin, transgalactose oligosaccharides (GOS),



xylooligosaccharides (XOS) and soy oligosaccharides such as stachyose, verboscose and raffinose. Termed immunosaccharides since they act as decoys for pathogen attachment (*Salmonella* and *E. coli*) and result in increased immunoglobulins (IgAs) at intestinal level.

#### **Define symbiotic**

Combined administration of probiotics and prebiotics, referred to as synbiotics, is supposed to cause synergistic effects in terms of gut health and performance.

#### **Define eubiotics**

Alternative products for replacement of antibiotic growth promoters.

#### **Define Phytogetic**

Phytogetics are derived from herbs, spices or aromatic plants and have shown antimicrobial, antifungal, antiviral, antioxidant or sedative properties. They are known for their appetizing effects, since they increase the palatability of the feed and stimulate endogenous digestive enzymes.

#### **If we used organic acids in feed instead of antibiotic then what will happen?**

Organic acids and some of their salts have been added to compound feeds for many years. The efficacy of fumaric acid, citric acid, formic acid, lactic acid, sorbic acid and also of some salts (Ca-formate, Na-formate) has been demonstrated. All these compounds are officially approved in the European Union (EU) as feed preservatives, however, some of them are used primarily for the stabilisation of health status and performance enhancement at dietary inclusion levels of 0.5 to 2.0 per cent. In order to reduce dietary inclusion levels and enhance their efficacy at economically feasible costs, either blends of organic acids or coated forms have appeared on the market in recent years.

#### **Beneficial effects of organic acids**

- Improvement of palatability and reduction of diet pH;
- Antimicrobial and preservative effects in the feed;
- Reduction of gastric pH and enhancement of pepsin activity;
- Effects on microflora in the gastro-intestinal tract, reduction of coliforms and diarrhoea;
- Increased digestibility of nutrients.

#### **Define essential oil compounds**

Another group of feed additives or promotor showing a potential for the replacement of antibiotic growth promoters are essential oil compounds, which are active ingredients present in various plants and spices (e.g. thymol, carvacrol, eugenol). Due to their antibacterial activity they might be able to modify the composition of intestinal microflora and to exert beneficial effects on performance of poultry and swine.

#### **What is breeding act of Punjab Govt Pakistan, 2014?**

By using standards quality semen, ova and embryos. The Authority shall, within six months of the commencement of the Act, issue regulations for;

- Semen handling and artificial insemination at a farm;
- Natural mating of livestock at a farm;
- Exotic semen and usage of exotic semen; and
- Import of semen in accordance with the provisions of the Act.

### **Contents of certificates**

The Authority shall, within six months of the commencement of the Act, specify the form and content of;

- Pedigree certificates for animals, semen and ova;
- Zoo technical certificates;
- Health certificates; and
- Such other certificates as may be notified by the Government to be issued by any person, body or authority.

### **Requirement of certificates**

The Registrar may, subject to the rules, specify certificates, which must accompany semen, ova, embryo, animal or any other thing under the Act.

### **The committee shall consist of the following persons:**

- A breeding expert having relevant qualifications and experience;
- An academician having relevant qualifications and experience; and
- A veterinarian having relevant qualifications and experience

### **Standards for selection of breeding animals**

The Authority shall, within twelve months of the commencement of the Act, issue standards and procedures for;

- Selection parameters for breeding animals at a collection and production facility;
- Parentage confirmation of breeding males before entry at a collection and production facility, farm or any breed improvement program; and
- Animal registration and performance recording for identification of elite dams and test mating under a performance recording and genetic evaluation program.

### **Describe the sources of macro and micronutrients**

#### **Macronutrients**

- Carbohydrates; Wholegrain cereals (oats, brown rice, pasta, grainy bread), root vegetables.
- Protein; Fish, chicken, lean meat, eggs, legumes, nuts, seeds, dairy products, and tofu.
- Unsaturated fats; Nuts, seeds, fish, olive oil, avocado.

#### **Micronutrients**

- Vitamin A; Milk, cheese, eggs (yolk), orange and yellow fruits and vegetables
- Vitamin B; Legumes, wholegrain cereals, nuts, seeds, green leafy vegetables
- Vitamin C; Citrus fruits, broccoli, strawberry, parsley, cabbage
- Vitamin D; Citrus fruits, broccoli, strawberry, parsley, cabbage
- Vitamin E; Olives and olive oil, avocado, wholegrain cereals
- Iron; Lean meat, green leafy vegetables, legumes
- Calcium; Dairy products, almonds, tahini, green leafy vegetables
- Magnesium; Nuts, seeds, whole grains, legumes, green leafy vegetables
- Zinc; Lean meat, chicken, fish, sunflower and pumpkin seeds
- Selenium; Brazil nuts, wheat germ, sunflower seeds, oats

## **Veterinary Medicine**

### **Define medicine**

The art or science of treating disease with drugs or curative substances, as distinguished from surgery and obstetrics.

### **Which disease is caused by Mycoplasma in small ruminant?**

- CCPP (Contagious Caprine Pleuropneumonia)
- Lungs and respiratory involvement
- Inj Tylosin 3 ml/goat (large animal)

### **Diagnose the Sub-clinical mastitis and which test is performed**

- No apparently abnormality on udder and teat. Internal bacterial process has been started.

### **What is Surf field M test (SFMT)?**

- 3% surf solution.
- Take equal amount of Surf solution and milk sample then check the flakes and agglutination. If it indicates flakes formation then test is positive (have mastitis).

### **What is somatic cell; define it?**

- Somatic cell is any cell of the body except sperm and egg cells. Somatic cells are diploid, meaning that they contain two sets of chromosomes, one inherited from each parent.

### **What is the somatic cell in mastitis?**

Somatic cells are cells from the cow (predominantly white blood cells, otherwise known as leukocytes) that are normally present in milk. During most mastitis infections, the number of somatic cells present in the udder increases to help the cow fight against the infection. There are several types of somatic cells that have different functions in fighting infection. Somatic cells can contain lipolytic and proteolytic enzymes, which degrade fats and proteins, respectively. An increase in somatic cells count during a mastitis infection increases the amount of destructive enzymes present in the milk, which increases the rate of deterioration of the milk fat and protein.

### **What is Local name of foot and mouth diseases (FMD)?**

- Monh Khur

### **Diagnosis**

- Tiger heart
- In young calf post-mortem lesion on heart tiger like striking.

### **Differentiate FMD (Aphtho virus, Picornaviridae) with other disease**

- Vesicular stomatitis (rhabdoviridae)
- Both have same sign lesion on oral mucosa tongue, gum, muzzle but FMD have also on teat and udder and pathognomonic sign of FMD is inter digital hoof lesion.

### **Treatment**

- Inj Amoxiclyline 15 - 20 ml or Tribersim 15 - 20 ml/large animal I/M
- Inj Meloxicame 15 - 20 ml I/M
- Somogel on vesicle

- $ZnSO_4$  2 - 4% solution dipping of hoof
- Soft feeding or soaked breed with milk.

#### **Define Oss penis and mention species**

The baculum (also penis bone, penile bone or os penis) is a bone found in the penis of many placental mammals. It is absent in the human penis, but present in the penis of other primates, such as the gorilla and chimpanzee and in dog. The bone is located above the male urethra, and it aids sexual reproduction by maintaining sufficient stiffness during sexual penetration.

#### **Define os cordis**

It has been present in the heart of some of the larger animals, as the ox and elephant.

#### **Bleeding from Natural orifices; diagnosis disease**

*Bacillus anthrax.*

#### **Define term vaccine and its mechanism**

A substance that is usually injected into a person or animal to protect against a particular disease or A preparation of killed microorganisms, living attenuated organisms, or living fully virulent organisms that is administered to produce or artificially increase immunity to a particular disease.

#### **Describe strangle disease in horse**

Strangles is one of the most common equine diseases in horses. It is a highly contagious infection of the upper respiratory tract caused by the bacteria *Strep. equi* (*Streptococcus equi* subspecies *equi*). Especially sub mandibular and retropharyngeal lymph nodes are involved. It is the disease of small (young) horses.

#### **Describe glander disease in horse**

Glanders is a contagious, short- or longterm, usually fatal disease of the horse family caused by the bacterium *Pseudomonas mallei*. In past it was known as *Burkholderia mallei*. The disease is characterized by the development of ulcerating growths that are most commonly found in the upper respiratory tract, lungs, and skin. Humans and other animals are also susceptible, and infections are usually fatal.

If the nodules are mainly in the nostrils, lungs and other internal organs, the disease is known as glanders.

If the nodules are mainly on the surface of the horse's limbs or body, the disease is known as farcy.

#### **Mention CNS diseases in poultry**

- N D (Newcastle disease)
- Avian encephalomyelitis

#### **Differentiate B/w M G and M S**

- *Mycoplasma gallinarum*
- *Mycoplasma synovia*

#### **N D disease sign and symptoms**

Newcastle disease is an infection of domestic poultry and other bird species with virulent Newcastle disease virus (NDV). It is a worldwide problem that presents primarily as an acute respiratory disease, but depression, nervous manifestations, or diarrhea may be the predominant clinical form.

### Etiology and Pathogenesis

NDV, synonymous with avian paramyxovirus serotype 1 (PMV-1), the most important of the 11 known PMV serotypes as a pathogen for poultry.

### Listen carefully; 22<sup>nd</sup> week layer flock having sign of inflamed bursa and haemorrhages on thigh region describe the diseases

At this period in layer IBD never occur because bursa decreases in size and atrophied. The period of most apparent clinical symptoms and high death rate of IBD is at the age of 3 - 6 weeks in broiler and layer. However, IBD could be observed as long as chickens have a functioning bursa (up to the age of 16 weeks only in layer). Therefore, first listen and then give answer.

### Differentiate B/W endometritis and retained placenta

Endometritis is an inflammation of lining of the uterus, and it does usually occur due to an infection. Untreated infections can lead to complications with the reproductive organs, problems with fertility, and other general health problems.

### Causes and risk factors of endometritis

- Sexually transmitted infections (STIs), such as chlamydia and gonorrhea
- Tuberculosis.

### Define retention of fetal membranes, or retained placenta

It usually defined as failure to expel fetal membranes within 24 hr. after parturition. Normally, expulsion occurs within 3 - 8 hr. after calf delivery [10]. The incidence in healthy dairy cows is 5% - 15%, whereas the incidence in beef cows is lower. The incidence is increased by abortion (particularly with brucellosis or mycotic abortion), dystocia, twin birth, stillbirth, hypocalcemia, high environmental temperature, advancing age of the cow, premature birth or induction of parturition, placentitis and nutritional disturbances [10]. Cows with retained fetal membranes are at increased risk of metritis, displaced abomasum, and mastitis.

### Treatment

Post-partum administration of PGF2alpha, oxytocin or calcium.

Eimeria species	Host species	Site of infection	Pathogenicity
<i>E. acervulina</i>	Chickens	Anterior Small Intestine	High
<i>E. brunette</i>	Chickens	Small And Large Intestines	High
<i>E. maxima</i>	Chickens	Mid Small Intestine	Moderate
<i>E. mitis</i>	Chickens	Small And Large Intestines	Low

Table 6: Tell the names of Eimeria species in poultry birds [11].

### Disease management programs (DMP)

Are structured treatment programs for chronically ill patients. DMP will through targeted supply management in the form of standardized treatment - and care processes help the treatment of chronic diseases throughout their history to improve.

**Endemic or enzootic:** (Of a disease or condition) regularly found among particular people or in a certain area.

**Epidemic or epizootic:** A widespread occurrence of an infectious disease in a community at a particular time.

**Pandemic or panzootic:** (Of a disease) prevalent over a whole country or the world.

**Sporadic:** Occurring at irregular intervals or only in a few places; scattered or isolated.

**Define physiology:** The branch of biology that deals with the normal functions of living organisms and their parts.

**Define system:** A set of things working together as parts of a mechanism or an interconnecting network; a complex whole.

**What is global warming:** A gradual increase in the overall temperature of the earth's atmosphere generally attributed to the greenhouse effect caused by increased levels of carbon dioxide, chlorofluorocarbons (CFCs), and other pollutants.

**Define drug or medicine:** Natural or synthetic substance which (when taken into a living body) affects its functioning or structure, and is used in the diagnosis, mitigation, treatment, or prevention of a disease or relief of discomfort. It is also called legal drug or medicine.

#### **Describe about the navil ill in calves**

Navel ill is a term that describes several conditions affecting the umbilicus (navel cord). The navel cord contains blood vessels that supply the calf with oxygen and nutrients during gestation. Sometimes, the bacteria settle in the joints of the calf causing severe infections of the joints later in life. This condition is called "joint ill." This condition is initiated by exposure to wet, muddy, and/or unsanitary conditions at birth, resulting in contamination of the navel cord before it can close. Historically, dipping or spraying the navel cord with iodine-type disinfectants at birth has been used, but success is questionable.

#### **What is TADs (Transboundary animal Diseases) describe it?**

Transboundary animal diseases are highly contagious epidemic diseases that can spread extremely rapidly, irrespective of national borders. They cause high rates of death and disease in animals, thereby having serious socio-economic and sometimes public health consequences while constituting a constant threat to the livelihoods of livestock farmers. Or Transboundary Animal Diseases (TADs) are those epidemic diseases which are highly contagious or transmissible and have the potential for very rapid spread, irrespective of national borders, causing serious socio-economic and possibly public health consequences.

#### **Common causes of Hematuria (blood in the urine)**

- Kidney infections
- Enlarged prostate
- Urinary tract (bladder) infection
- Swelling in the filtering system of the kidneys (this is called "glomerulonephritis")
- A stone in bladder or in a kidney
- A disease that runs in families, such as cystic kidney disease.

#### **Describe B H**

Bacillary hemoglobinuria is an acute, infectious, toxemic disease caused by *Clostridium haemolyticum*. It affects primarily cattle but has also been found in sheep and rarely in dogs. *C haemolyticum* is a soil borne organism naturally found in the GI tract of some cattle. The general clinical picture and postmortem findings usually permit a tentative diagnosis.

#### **Control**

The incubation period of this disease is 7 - 10 days. Cattle that are in the poor health condition seem to be the most susceptible. Vaccination is recommended in the spring, prior to the expected occurrence of the disease. (This disease occurs mainly in the late summer and autumn.) Annual boosters are necessary. It is recommended to vaccinate every 6 months where constant exposure is possible. Vaccinate calves at 3 to 4 months of age.

#### **Define Monday morning Disease why it is known?**

Myoglobinurea or azoturia.

The cramping usually occurs in the muscles of the horse's hindquarters and the back - causing stiffness and pain.

The pain may be severe enough to cause sweating and labored breathing. The stiffness may be so severe that it prevents the horse from moving. The classical form of azoturia is often associated with resting the horse on full feed rations - hence the name "Monday Morning Disease" as it most often occurs after a day's rest on a Sunday.

### **Define three day sickness disease**

Bovine Ephemeral Fever (BEF) is a viral disease of cattle and buffalo. Typically, affected animals are only sick for a few days, hence the alternative name - Three Day Sickness.

### **Sign**

- There is a sudden onset of fever- as high as 41°C compared with the normal temperature of about 38°C. The temperature returns to normal within 36 hours. Severe drop in milk production. Cows in advanced pregnancy may abort. This is probably because of the fever, rather than a specific effect of the virus.
- Animals stop eating and drinking and become depressed. They usually drool saliva, develop a stringy nasal discharge, and may have watery eyes.
- A virus known as a rhabdovirus causes BEF. It is also referred to as an arbovirus because biting insects (mosquitoes, such as *Culex annulirostris*) spread these diseases.
- The distribution of these insects varies with climatic conditions, which in turn will influence the pattern of disease spread and time of occurrence.

### **Why we used primadog vaccine first in young puppies?**

If the dam is vaccinated and the pups have had the dams milk for one month there is no need to vaccinate at this period. Thus 1st shot goes at the age of 6 weeks, not before 6 weeks; otherwise you will be destroying the pup's immunity which he has got from the dam through milk. Primodog is the best puppy shot for this age.

### **List of zoonotic diseases mostly asked question in interview**

- Anthrax
- Animal influenza
- Bovine Spongiform Encephalopathy (BSE)
- Food borne zoonoses
- Haemorrhagic fevers
- Leptospirosis
- Prion diseases
- Tularaemia
- By Ticks Bordetella (Kennel Cough) lyme disease
- Brucellosis
- Campylobacteriosis Cat Scratch Disease (Bartonellosis)
- Chagas disease
- Cysticercosis
- Dengue
- Dermatophytosis (ringworm)
- Ehrlichiosis
- Encephalitis

- Giardia
- Hantavirus
- Influenza A
- Swine Flu (H1N1)
- Avian Flu (H5N1)
- Echinococcus hydatid cysts
- Leishmaniasis
- Leptospirosis
- Psittacosis (Parrot Fever)
- Q-fever
- Rabies
- Ringworm
- Rocky Mountain spotted fever
- Roundworms
- Salmonella
- Toxoplasmosis
- Trichinosis
- Tuberculosis
- Tularemia
- Typhus
- Yellow Fever

#### **What is weaning age in calf**

Calves are ideally weaned when they are 7 to 8 months old.

#### **Describe acrosomal reaction**

The acrosome is a cap-like structure over the anterior half of the sperm's head. As the sperm approaches the zona pellucida of the egg, which is necessary for initiating the acrosome reaction, the membrane surrounding the acrosome fuses with the plasma membrane of the oocyte, exposing the contents of the acrosome.

#### **What are the causes of abortion?**

- Chromosomal problems
- Unhealthy lifestyle (obesity, drug and alcohol use)
- Maternal age
- Trauma
- Untreated thyroid disease
- Infections

#### **Antibiotic treatment of mastitis**

Commercial intramammary products that contain amoxicillin, penicillin, and erythromycin are as efficacious as procaine penicillin G infusions derived from multiple-dose vials.



### **Non antibiotic treatment of mastitis**

By using Selenium and vitamin E.

In the last ten years, several researchers have looked into the use of supplements and the role of selenium and vitamin E in the prevention and treatment of mastitis. Maintaining an adequate level of selenium in the cow helps to prevent mastitis, reduce the severity of infection and shortens its duration. Selenium serves to reinforce the immune system response by increasing the release of leucocytes and increasing the efficiency of phagocytes. Selenium and vitamin E work together in the cow. Thus, a vitamin E supplement alone of 1000 IU/day reduces the somatic cell count but not the incidence of mastitis.

With both selenium and vitamin E supplements, infections may be reduced by approximately 40% at calving, by 60% for the entire duration of the infection and by 30% for clinical mastitis. The role of selenium is considered to be most significant in the case of subclinical mastitis.

### **How will you physical examine the animal while standing in the shed either is healthy or disease condition**

By observing regurgitation or re-mastication. If animals are not re-masticating then animal are not well.

### **Report the Clear-cut indication of Anthrax or wool sorter disease**

Bleeding from natural orifices, absence of rigor mortis.

### **What are benefits of artificial insemination (AI)**

- Protection from venereal diseases (sexually transmitted)
- Indoor facility
- Fewer chances of endometritis
- Protection the diseases farm to farm (by moving animal to farm)
- High conception rate.

### **Describe seasonal or environmental diseases.**

#### **Norovirus**

The most common stomach inflammation illness, commonly referred to as the stomach flu, norovirus reaches its highest strength during the winter months.

#### **Acute ear infections**

Ear infections, especially in young animals, are more likely to occur in winter than any other season, Symptoms of general ear pain and even nausea are the most disruptive symptoms.

#### **Bronchiolitis**

A virus that impact young animals, mostly under the age of two, bronchiolitis is a swelling and mucus buildup within the smallest lung air passages. The virus peaks in the fall and winter months. Spread by direct contact.

The CDC (center for disease control) recommends washing hands frequently as the easiest way to prevent the seasonal infections, such as diphtheria and chickenpox, to faecal-oral infections, such as cholera and rotavirus, vector-borne diseases including malaria and even sexually transmitted gonorrhoea.

#### **Parasitic diseases**

Dogs are quite at risk of interior and exterior parasites. Normally symptoms include scruffy or dull coat, weight loss, appetite loss, coughing, vomiting and diarrhea and stomach ache.

**Seasonal allergy**

Dogs may be allergic to a number of seasonal items, just like fleas, grass and several plants, and mild in summer season.

**Enlist the FMD virus and its strain which are prevalent in Pakistan**

Picornaviridae, Aphthovirus. There are 7 strains: O, A, C, Asia 1, SAT 1, SAT 2, Sat 3. O, A, Asia 1 present in Pakistan.

**Why we inject booster dose**

Booster doses keep your animal safe and protect dog from a range of diseases. Boosters can be described as a ‘reminder’ to your animal immune system.

However, a small minority of young animal doesn’t become immune after the first injection and are still susceptible to the disease. So they need booster shots to build up immunity.

Also, some animal tend to lose their immunity over time if they don’t receive the recommended booster shots. For some immunizations, your dog will need a course of vaccines to build up his defenses and to provide life-long immunity. Sometimes, vaccine boosters are needed, because the immune response ‘memory’ weakens over time. For example, anti-tetanus injections may need to be repeated every ten years.

**Why there is need boosters doses in the puppy or kitten?**

Once the immunity the puppy or kitten received from its mother begins to wear off, each booster will stimulate greater immunity in that patient. Boosters are necessary to bring the antibody level up to the highly protective range. The last injections in the series usually boost the immunity the most.

<b>Antibiotic Drug or Class</b>	<b>How it affects male fertility</b>	<b>Comments:</b>
Minocycline	Toxic to developed sperm	Toxic to bovine (cow) sperm; believed to be toxic to human sperm as well
Nitrofurantoin (nitrofurantoin, furadantin)	Interfere with sperm production resulting in decreased sperm count	Unknown if lower doses affect sperm to a smaller degree – recommendation is to choose an alternative antibiotic
Macrolides (erythromycin, troleandomycin)	May cause reduced sperm motility or sperm death (spermicidal)	Present information based on animal data, but believed to apply to humans as well
Aminoglycosides (neomycin, gentamicin)	Negative affects on the production of sperm; neomycin can reduce count and motility	Other aminoglycosides have not demonstrated any negative effects on sperm in laboratory studies
Sulfasalazine	Can cause a decrease in sperm count, motility, and morphology	Reversible after discontinuation of drug. Case reports are in patients being treated for inflammatory bowel disease (IBD)

**Table 7:** Numerous antibiotics cause male infertility mention names [12,13].

**In the field if you find a horse having bloated what will you do when you have no option?**

Bloat causes problem in ruminant and this word is used for ruminants but the word tympany is used for horse and approach is from right side ventral to flank region. Thus, understand question first then give answer.

**Tell us the four part of horse stomach**

Horse is mono gastric animals (Simple or one stomach). Be careful while listening question.

**Report the names of diseases caused by clostridia**

- Enterotoxemia
- Bacillary haemoglobinuria
- Tetanus
- Malignant edema
- Black leg or quarter (B Q)
- Black disease

**Which disease is known shipping fever?**

H S (hemorrhagic septicemia) by pasteuria.

**Describe the name of Ticks borne diseases**

- Crimean- Congo haemorrhagic fever by hyalomma tick
- Babesia by boophilis or rephicephalis
- Anaplasma
- Theileria parva

**Mention the name of mosquito borne diseases**

- Dengue fever by *Aedes aegypti* 1 - 4 types
- Zika virus by *Aedes aegypti*
- Malarial fever

**Describe the name of spores forming bacteria**

- *Bacillus*
- *Clostridia*

**Which type of sperm fertilized the ova or egg**

Zigzag sperm not the straight.

**Disease outbreak in Pakistan (shekhupura, Lahore, okara, gujrawala) and its surrounding region in season of rice crop, report the name of disease**

In 1930, Deg Nala disease was introduced in Pakistan due to fungus.

**Etiology**

**There are two basic theories about cause**

According to Indian workers it is due to excessive ingestion of toxic amount of selenium contaminated fodder grown on selenium rich soil. Feeding of rice straw for long period is associated with this disease. Selenium is accumulated in rice straw. Its concentration is 8 - 11.6 times high in straw rice than grains and grains may contain 5.2 - 9.8 times higher concentration of Selenium than soil.

In Pakistan Dr. Muhammad Irfan, Ex Dean, Faculty of Veterinary Science, University of Agriculture, Faisalabad pointed out that this disease is due to mycotoxin produced on rice straw. Whenever it is stored in moist condition then the chances of growth of fungus increase and there will be production of mycotoxins.

### **Treatment**

An antidote Deg cure developed at National Research Institute of India, Kernal. It contains  $MgSO_4$  1 Kg,  $FeSO_4$  166g,  $CuSO_4$  24 g,  $ZnSO_4$  75 g,  $CoSO_4$  15 g. Two doses of 30 grams are given orally/day. After 1 - 2 days repeat dose and local anti-septic dressing (ASD) of lesions so that flies do not sit and produce maggots. Recovery after 10 - 15 weeks but not possible if hooves have shed.

### **Report the name of diseases which causes drop in egg production**

- N D (New castle disease)
- A I (Avian influenza)
- I B (Infectious bronchitis)
- I C (Infectious coryza)
- A E (Avian encephalomalitis)

### **Tell the name of respiratory diseases**

- N D (New castle disease)
- A I (Avian influenza)
- I B (Infectious bronchitis)
- I C (Infectious coryza)
- Mycoplasma (Chronic respiratory disease)
- I L T (Infectious laryngotracheitis)

### **Milk fever and treatment**

Milk fever, postparturient hypocalcemia, or parturient paresis is a disease, primarily in dairy cattle, but also seen in beef cattle, characterized by reduced blood calcium levels (Hypocalcemia) [14]. It occurs after parturition, at onset of lactation [15].

Infusion 500 ml of 40% calcium borogluconate administered intravenously. Also supplemented with 500 ml of 10% sodium phosphate administered intravenously, and 80g calcium as calcium lactate and 70g inorganic phosphorus as sodium phosphate administered orally in drinking water [15].

Intravenous calcium, though indicated in many cases, is potentially fatal through "heart blockade", or transient high calcium levels stop the heart, thus it should be administered carefully [15].

### **Ketosis and treatment**

A condition characterized by raised levels of ketone in the body, associated with abnormal fat metabolism and diabetes mellitus. The main ketone bodies used for energy are acetoacetate and  $\beta$ -hydroxybutyrate [16,17].

IV administration of 500 mL of 50% dextrose solution is a common therapy. Administration of glucocorticoids, including dexamethasone or isoflupredone acetate at 5 - 20 mg/dose, intramuscular (IM), may result in a more sustained response, relative to glucose alone. Glucose and glucocorticoid therapy may be repeated daily as necessary [16].

Propylene glycol administered orally (250 - 400 g/dose) once per day acts as a glucose precursor and is effective as ketosis therapy [17]. Overdosing propylene glycol leads to CNS depression. Ketosis occur within the first 2 week after calving [16].

### **Tell the name of diseases which form intranuclear inclusion bodies?**

- Egg drop syndrome (EDS)
- Inclusion body hepatitis (IBH)
- Hydropericardium syndrome (HPS)

### **Describe Displaced Abomasum (DA), Left Displaced Abomasum (LDA), Right Displaced Abomasum (RDA)**

Cows have a specialized digestive system that helps them process their high fiber diet. They have four distinct compartments to their stomach (the rumen, reticulum, omasum and abomasum). The rumen, reticulum and abomasum are the forestomach compartments [16].

The abomasum is suspended by a loose attachment to the body wall, which means it can potentially move out of its normal position where it can fill up with gas and prevent normal flow of feed through the digestive track (called an abomasal displacement).

Abomasal displacements typically occur in high producing dairy cows. No one knows exactly what causes the abomasum to move out of its normal position. The majority of abomasal disorders occur in dairy cows during the first 3 months of lactation (milk production).

#### **There are 2 types of commonly seen abomasal displacements:**

- Left Displaced Abomasum (LDA), most common
- Right Displaced Abomasum (RDA)

The abomasum can also twist on itself, called abomasal “volvulus”. This can cut off the blood supply to the abomasum. If this isn’t corrected quickly the abomasum tissues start to die.

#### **Prevention**

- Ensure cattle are not too fat at calving (i.e. > 3.5 BCS);
- Feed high quality feeds, with good quality forage;
- Feeding a total mixed ration as opposed to concentrates;
- Ensure plenty of space at feeding sites;
- Minimize changes between late dry and early lactation ration;
- Prevent and promptly treat, diseases such as milk fever, metritis, toxic mastitis and retained afterbirth which reduce feed intake;
- Maximize cow comfort, minimize stress.

#### **Define the term Intussusception**

Intussusception is a serious condition in which part of the intestine slides into an adjacent part of the intestine.

An intussusception is a medical condition in which a part of the intestine invaginates (folds into) into another section of intestine.

#### **Double intussusception**

A second intussusception that involves the bowel above the first; the first intussusception is followed by contraction of the bowel wall around it, and the solid mass so formed is enveloped by the proximal portion of the bowel and is thus the cause of the second intussusception.

#### **Umbilical hernia**

The umbilical cord connects Dam (mother) and fetus while in the uterus. Fetus’ umbilical cords pass through a small opening in their stomach muscles. In most cases, the hole closes soon after birth. An umbilical hernia occur when the stomach muscles don’t join completely and the intestine or other tissues bulge through this weak spot around the belly button (umbilicus).

Umbilical hernias are generally painless and don’t cause any discomfort. About 90 percent of umbilical hernias will eventually close on their own.

#### **Causes of umbilical hernia**

An umbilical hernia occurs when the opening in the stomach muscle allows the umbilical cord to pass through holes when it fails to close completely. Umbilical hernias are most common in young foal, but they can also occur in adults.

### **Define the term Diabetes insipidus and diabetes mellitus**

A rare form of diabetes caused by a deficiency of pituitary hormone vasopressin, which regulates kidney function. Diabetes insipidus (DI) is a rare disease that causes frequent urination.

DI caused due to lack of ADH is called central diabetes insipidus. When DI is caused by a failure of the kidneys to respond to ADH, the condition is called nephrogenic diabetes insipidus.

Central diabetes insipidus can be caused by damage to the hypothalamus or pituitary gland as a result of:

- Head injury
- Infection
- Loss of blood supply to the gland
- Surgery
- Tumor

### **Define the term Diabetes mellitus**

The common form of diabetes, caused by a deficiency of the pancreatic hormone insulin, which results in failure of metabolize sugars and starch. Sugars accumulate in the blood and urine, and the by-products of alternative fat metabolism disturb the acid-base balance of the blood, causing a risk of convulsions and coma. Or Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels.

### **Define urea toxicity and normal level in the animal body and its treatment**

#### **Physiology of toxicosis**

Nitrogen in ruminant rations is derived from two sources: 1) Natural plant and animal protein, and 2) Non-protein nitrogen (NPN), such as urea or ammonia. Non-protein nitrogen is used as an economical supplement for nitrogen in poor ruminant rations. Rumen microbes convert NPN to ammonia via urease [18]. The ammonia is then combined with keto-acids by the microbes to produce amino acids. Urease in rumen will continue to convert urea to ammonia even if there is a lack of keto acids. If the rate of ammonia production (i.e., urea via urease breakdown to ammonia) or ingestion of ammonia (i.e. ammoniated feeds) exceeds the microbes ability to utilize it to form amino acids, there is an accumulation of ruminal ammonia [19]. Ammonia absorbed from the rumen into systemic circulation is normally detoxified by the liver via the urea cycle. This detoxification system can be overwhelmed resulting in elevated blood ammonia levels [18].

Or rumen microbes convert urea to microbial protein and  $\text{NH}_3$ . The microbial protein flows past the rumen, for digestion and absorption mainly in the small intestine. The  $\text{NH}_3$  is absorbed in the rumen, reticulum and omasum. It is carried in the portal vein to the liver, where it is detoxified to urea, amino-acids, etc. Some  $\text{NH}_3$  escapes from the liver into the general circulation [19].

#### **Causes of toxicosis**

The most common causes of toxicosis from NPN supplementation include:

- Improper mixing of NPN resulting in concentrated pockets.
- Calculation error resulting in excessive supplementation.
- NPN rations low in carbohydrates prevents proper formation of keto acids.
- Free-choice access to NPN rations.

**There are several factors which make animals more prone to ammonia toxicosis:**

- Hungry animals will consume excessive amounts.
- Decreased water intake.
- Elevated body temperature increases urease activity.
- Liver disease.
- Stressed animals (recently shipped, castrated or vaccinated).

**Clinical signs**

The onset of clinical signs may vary from a matter of only 15 minutes to several hours. Death usually occurs around 24 hours following ingestion, but can range from less than one hour to three to four days. Clinical signs include ear twitching, pupil dilation, rapid eye blinking, dyspnea, excessive salivation, frequent urination/defecation, ataxia, and tonic convulsions induced by stimuli.

**Diagnosis**

Normal blood/vitreous ammonia concentrations should be less than 0.5 mg/dl. Clinical signs appear when blood ammonia levels reach approximately 1.0 mg/dl. Death usually occurs at blood ammonia concentrations greater than 2.0 mg/dl.

**Treatment**

Acidify the rumen by infusing two to six liters acetic acid (vinegar) per animal (cattle) or 0.5 - 1 liter in sheep and goats. Follow the vinegar with large volumes (20 - 30L [adult cattle]) of cold water.

**Prevention of diseases**

- Thumb rule: remember the main steps for all the diseases prevention
- Vaccine
- Control is best achieved by eliminating the disease in animals
- Avoid drinking raw or unpasteurized milk and products made from raw or unpasteurized milk
- Educate farmers, abattoir workers and other occupational at risk groups on how to prevent infection when handling infected animal products
- Cover open cuts and sores with dressings
- Wear gloves, overalls and face masks when slaughtering animals or handling animal products
- Thoroughly wash hands and arms after handling animals or their products
- Take special care when handling animal birth products
- Thoroughly clean all working areas

**Mass vaccination**

**Mission**

- To alleviate poverty
- To provide doorstep services
- To provide public health safety
- To make Pakistan Disease Free Zone
- To make Pakistan Hub of Dairy Products
- To use Livestock as an Engine of Economy

- To enhance the production of meat and milk
- To provide awareness to Livestock Breeders
- To export surplus livestock and dairy products
- To introduce modern technology in Livestock Sector

#### **Civil veterinary hospital activities**

- Vaccination of large and small animals including rural poultry
- Deworming of small and large ruminants
- Treatment of sick animals
- Breed improvement through artificial insemination (AI) Program
- Up gradation of genetic potential by controlling reproductive disorders
- Training to community livestock workers at village level
- Registration of progressive breeders and formation of breeder associations
- Extension of Mobile Vet. Services at door step of Livestock breeders
- Diagnostic facilities through diagnostic Laboratory at Distt. Head quarter (HQ)
- Dairy Loaning through commercial banks
- Awareness through School Focus Program
- Training of Female Livestock Workers
- Field Day and Farmer Day Activities
- Provision of Quick Services Citizen Call Center
- Registration of Animals at Cattle center (Mandies) and Provision of Vet. Services
- One Window Operation Activity by consultation and physically facilitation
- Disease Surveillance and reporting activities
- Slaughter House and Meat Inspection activities
- Introducing Modern Technologies for the production of meat and milk

#### **Describe traumatic pericarditis in cattle**

Pericarditis is an inflammation of the pericardium with accumulation of serous or fibrinous inflammatory products. In cattle, it is almost always attributable to a reticular foreign body that has penetrated the reticular wall, diaphragm and pericardial sac. The lead signs of pericarditis are tachycardia, muffled heart sounds, asynchronous abnormal heart sounds, distension of the jugular veins and submandibular, brisket and ventral abdominal oedema.

#### **Differentiate B/W paracentesis and thoracentesis**

- Paracentesis or peritoneocentesis (also called laparocentesis)
- Removal of fluid from peritoneal cavity.

**Thoracentesis:** Removal of fluid from thoracic cavity.

#### **If a case of pancreatic lithiasis (stone formation) in horse come at veterinary hospital; what will you suggest them?**

Nothing because pancreas is absent in equine. Thus, listening is very important.



**Which one part of system is absent in equine family**

Pancreas.

**Report the Swollen Head syndrome (SHS) in poultry birds**

Swollen head syndrome (SHS) is a complicated infection in broilers and broiler breeders, where the primary etiological agent is an avian pneumovirus (APV) and paramyxoviridae family and the secondary agent is E. coli; it is characterized by respiratory and nervous signs. In broilers chickens, SHS is generally seen after the 4th week of life. The first clinical signs are sneezing, coughing, rales and conjunctivitis.

**If you are invited at invitation and ox and horse thoracic part of meat is placed in front of you how will you differentiate it?**

By observing ribs if cylindrical then it shows horse meat if flat it will indicate ox meat.

**Pharmacology**

**Define pharmacology:** The study of the features and characteristics of drugs and medications.

**Define toxicology:** The study of the effects of poisonous substances on the body.

**Some specific terminology asked in interview**

**Absorption rate constant:** The rate at which a medication is absorbed from dosage site to measurement location. This is applicable to all drugs except intravenous medications.

**Accumulation, accumulation ratio:** The amount of a medication found within a bodily fluid at a specific point when a steady state has been attained. The point of equality between drug administration and drug elimination.

**Accuracy:** The amount of error found in the results of a scientific equation.

**Activity, intrinsic:** The quality of a drug that ascertains (work out) what the biological result will be. This is also referred to as intrinsic efficacy.

**Addiction:** A situation where use of a drug has changed the behavior and methods of the user, creating a need for it in order to continuing using or to obtain more of it.

**Affinity:** The extent to which one substance tends to want to bind with another.

**Allergic response:** A situation in which the body forms antibodies against a specific drug, causing a physical reaction that may or may not be severe.

**Amplification:** The quantity of change in determined output per unit change in input.

**Analgesic:** A medication that alleviates pain without the patient losing consciousness.

**Anesthetic:** A medication that causes loss of sensation. This is sometimes used to alleviate pain or for loss of consciousness for surgical procedures.

**Antagonism:** The combined result of two drugs being less than the sum of the two drugs put together. In essence, the whole is less than the sum of its parts.

**Area under the curve:** The area on a graph that falls under the curve when plotting time after administration of a drug against the plasma concentration of a drug. It is used to estimate how long it takes for a drug to be removed from the body.

**Define AUC:** The abbreviation of Area Under the Curve, or, the area of a graph that falls under the curve when plotting administration of a drug against the plasma concentration of a drug.

**Availability:** Also referred to as bioavailability, this is the amount of a drug dosage that is absorbed into circulation after administration of a specific dosage.

**Define Bo:** On a graph, the slope that occurs when concentration is plotted against the drug half-life (or C is plotted against t).

**Bioassay or biological assay:** Establishing the strength of a chemical, physical, or biological agent, by way of a biological marker.

**Biopharmaceutics:** The study of how the pharmaceutical expression of certain drugs can impact their pharmacodynamic and pharmacokinetic behavior.

**Biotransformation:** The chemical change of a drug that happens due to the effects the body has on it.

**Define biotranslocation:** The transfer and movement of drugs in and throughout biological organisms.

**Define blind experiment:** A type of experiment in which the participants are unaware of the drug doses or treatments involved, so as not to affect the outcome.

**Ceiling:** The maximum result of a drug within a bodily tissue, regardless of the volume of the drug administered.

**Chemotherapy:** The treatment of cancerous or parasitic illnesses, where the drug affects only the neoplastic cells or invading organisms.

**Clearance:** The amount of the bodily fluid from which a drug is eliminated or excreted.

**Clinical therapeutic index:** An assessment of a drug having more safety at an acceptable level of potency or more potency at an acceptable level of safety within the recommended drug dosage.

**Compartment(s):** The area within the body that a drug tends to dwell (reside) in after it has been absorbed.

**Compliance:** The level of cooperation of a patient when following a prescribed treatment regimen.

**Cross-over experiment:** A type of experiment in which each participant receives a test preparation. The preparations are then crossed between participants in order to calculate the effects of the test preparation through various participants.

**CT index:** The measure of the effects of a drug as calculated by plotting drug concentration against time.

**Dependence:** A physical need to maintain administration of a specific drug in order to avoid withdrawal symptoms.

**Disintegration time:** The time it takes for a drug tablet to dissolve into pieces of a set size or smaller.

**Dissolution time:** The time it takes for a certain amount of a drug to be reduced to a solution from a solid form.

**Distribution:** The volume within a body in which the administered drug appears to have been dispersed. Also known as volume of distribution.

**Dosage form:** The physical structure and appearance in which the drug to be administered is in for use.

**Dose:** The amount or form of a drug that is given to a user.

**Dose-effect curve:** On a graph, this is the result of plotting the dose of a drug against its effect on the bodily system.

**Dose-duration curve:** On a graph, this is the result of plotting the dose of a drug against its duration of time in the body.

**Drug:** A substance used in the prevention and treatment of illness or disease.

**Drug Abuse:** The misuse of a drug resulting in potentially destructive consequences.

**Drug dependence:** Also referred to as addiction, this is a situation where use of a drug has changed the behavior and methods of the user, creating a need for it in order to continue using or to obtain more of it.

**Dummy:** A form of treatment that is meant to have no effect on the user, yet imitates the contrasting drug in every way. This is also known as a placebo.

**Effective:** A situation where an administered drug is successful in attaining its purpose.

**Efficacy:** The ability of a medication to produce a change in its intended cell receptor.

**Elimination rate constant:** On a graph, this is the result of plotting the logarithms of concentration against time.

**Equipotent:** Being equally effective or equally able to produce the drug effect of certain strength.

**Equivalence:** When drugs provide identical results when administered in the same amount, or those that contain equal dosages of the same type of drug, yet are named differently.

**Experiment:** Also called a bioassay, this is the process of establishing the strength of a chemical, physical, or biological agent, by way of a biological marker.

**First order kinetics:** The relationship of the speed of a chemical reaction in proportion to the concentrations of the reactants.

**First pass effect:** The absorption of a drug through the liver or intestines when taken in through the gastrointestinal tract but before reaching systemic circulation.

**Food and drug administration:** A federal organization responsible for ensuring compliance with the Food, Drug and Cosmetic Act.

**Generic drugs:** Drugs that have exactly the same ingredients and effectiveness as another, named drug or formulary.

**Habituation:** A psychological feeling of need for a certain drug due to its effects on the body.

**Half-life:** The time it takes for a drug concentration within the body to be reduced by one half of its original amount.

**Harrison act:** A federal law regulating the distribution, transport, and manufacture of all narcotics.

**Hazard:** A drug that has the ability to cause bodily harm.

**Hypersensitivity:** The necessary condition for a body to show an allergic response to a drug.

**Hypnotic:** A medication that produces an effect that causes a change in consciousness or is similar to a state of sleep.

**Idiosyncratic response:** An abnormal response from a drug that is specific to the person having the response.

**Infusion kinetics:** The plasma concentration of a drug over a long period of time as it is proportional to the rate of the drug administration and inversely proportional to the rate of excretion and the area through which the drug is distributed.

**Intrinsic activity:** The quality of a drug that ascertains what the biological result will be. This is also referred to as intrinsic efficacy.

**Latent period or latency:** The period of time between administration of a drug and the time at which an effect is achieved.

**Loading dose:** The first dose of a series that is larger than subsequent doses.

**Maintenance dose:** The doses in a series that follow the initial loading dose.

**Median effective dose:** The dose of a drug calculated to produce a result in 50 percent of the users of whom the drug was administered.

**Metameter:** A term used to label the measurement of change during biological testing.

**Multiple dose regimens:** A treatment schedule for a drug in which it is given at certain intervals.

**Narcotic:** A drug that is able to create an analgesic effect, which may sometimes induce an altered state of consciousness.

**National formulary:** A reference publication produced by the American Pharmaceutical Association that gives standards of purity for each drug.

**Negative control drug or negative control procedure:** A procedure incorporated into an experiment that it should not affect the experimental system in the same way as the independent variable.

**Parameter:** During an experiment, one of the components that can be controlled to remain constant throughout the procedure.

**Pharmacodynamics:** The study of how drugs produce their effects on the body.

**Pharmacogenetics:** The study of the inheritance of certain interactions from drugs on the human body.

**Pharmacokinetics:** The study of absorption, distribution, and biotransformation of drugs on the body.

**Placebo:** A form of treatment that is meant to have no effect on the user, yet imitates the contrasting drug in every way. This is also known as a dummy.

**Positive control drug:** A drug used in an experiment that has the expectation that its results will be similar to those of the independent variable.

**Potency:** The strength of a drug in terms of the concentration or amount administered.

**Potentiation:** A situation where the result of one drug is increased by the use of another drug that has no effect.

**Priming dose:** The first dose of a series that is larger than subsequent doses.

**Prodrug:** A substance with little action that becomes more active after being in the body.

**Precision:** The accuracy with which certain values of input can be understood by measured values of output.

**Receptors:** The part of a cell that responds to an administered drug.

**Reference standard:** A drug with specific aspects that is used as the foundation of comparison with other substances that have similar aspects.

**Reliability:** The degree to which the drug and organism relationship is reproducible if it is studied again under similar conditions.

**Risk:** The probability that damage will result from exposure to a specific agent.

**Selectivity:** The ability of a drug to affect one type of cell over others.

**Sensitivity:** The ability of a specific group to respond to a drug in a certain way compared to other organisms.

**Side effects:** Undesirable effects from drug treatment that are not intended as part of the therapeutic effect.

**Standard drug:** Establishing the strength of a chemical, physical, or biological agent, by way of a biological marker.

**Specificity:** The ability of a drug to show only one type of result.

**Standardized safety margin:** The amount of a drug that is effective in almost all of the population that must be surpassed in order to produce a fatal effect on a minimum amount of a population.

**Supersensitivity:** An excessive amount of sensitivity to a drug.

**Synergy:** The use of two drugs together provides a greater effect than the sum of the original drugs.

**Tachyphylaxis :** The building of tolerance to a drug after repeated administrations.

**Therapeutic index:** A number that measures the relative safety of a drug.

**Therapeutics:** The discipline and actions of returning patients to a healthy state.

**Threshold dose:** A dose of a drug that is just enough to produce its desired effect.

**Time concentration curve:** On a graph, the time concentration curve is the relationship between the dose of a drug and its latency period.

**Tolerance:** The reduced effectiveness of a drug after repeated administrations.

**Toxic effects:** An effect of a drug that is harmful or lethal to the user.

**United states pharmacopoeia:** A reference book that defines approved drugs and sets standards for their purity.

**Validity:** The amount of error found in the results of a scientific equation.

**Volume of distribution:** Also known as distribution, this is the volume within a person in which the administered drug appears to have been dispersed.

**Zero order kinetics:** A condition in which the speed of an enzymatic reaction is independent of the strength of the substrate.

**Define adjuvants:** Adjuvants are compounds that enhance the specific immune response against co-inoculated antigens. The word adjuvant comes from the Latin word adjuvare, which means to help or to enhance.

**Organic adjuvants:** While aluminium salts are popularly used in human vaccines, the organic compound squalene is also used. However, organic adjuvants are more commonly used in formulation of animal vaccines.

**Oil-based:** Oil-based adjuvants are commonly used in some veterinary vaccines. An 'oil [squalene] in water' adjuvant used in some human vaccines.

**Experimental adjuvants:** An increasing number of vaccines with squalene and phosphate adjuvants are being tested on humans.

**Veterinary vaccine and its qualities:** Vaccines adjuvants must enhance the specific immune response against pathogens and improve protection. They must be stable and safe as secondary effects can have an impact on the growth of the animal, the reproduction rate, the comfort of the animal or cause carcass blemish. Adjuvants must be easy to use. They should be also cost effective. A good adjuvant can allow a reduction of the dose or of the antigenic concentration, decreasing then the price of the vaccine.

**Which one is H<sub>2</sub> receptor blocker:** Cimetidine.

**Which one is anti-fungal agent**

- Terbinafine
- Itraconazole

- Fluconazole
- Amphotericin B

**How will you stop the bleeding in the field when you have no option**

By applying direct pressure on the cut or wound with a clean cloth, tissue, or piece of gauze until bleeding stops. If blood soaks through the material, don't remove it. Put more cloth or gauze on top of it and continue to apply pressure.

“Bacteriostatic” means that the agent prevents the growth of bacteria (i.e., it keeps them in the stationary phase of growth), and “Bactericidal” means that it kills bacteria.

**Tell the name of Bacteriocidal drugs**

- Penicillin (Beta-lactam antibiotics)
- Cephalosporin
- Monobactams
- Carbapenems
- Vancomycin
- Daptomycin
- Fluoroquinolones
- Metronidazole
- Nitrofurantoin
- Co-trimoxazole

**Telithromycin**

**Tell the name of bacteriostatic drugs**

- Tetracyclines
- Sulfonamides
- Spectinomycin
- Trimethoprim
- Chloramphenicol
- Macrolides
- Lincosamides
- Clindamycin
- Ethambutol

**Novobiocin**

- Tigecycline
- Oxazolidinone

**Tell the names of bactericidal disinfectants**

- Active chlorine (i.e. hypochlorites, chloramines)
- Active oxygen (peroxides, such as peracetic acid, sodium percarbonate, and urea perhydrate)
- Iodine (povidone-iodine, Lugol's solution, iodine tincture, iodinated nonionic surfactants)

- Concentrated alcohols (mainly ethanol, 1-propanol, called also n-propanol and 2-propanol, called isopropanol)
- Phenolic substances (such as phenol (also called «carbolic acid»), cresols such as thymol, halogenated (chlorinated, brominated)
- Strong oxidizers, such as ozone and permanganate solutions;
- Properly concentrated strong acids (phosphoric, nitric, sulfuric, amidosulfuric, toluenesulfonic acids) and
- Alkalis (sodium, potassium, calcium hydroxides), such as of pH < 1 or > 13, particularly under elevated temperature (above 60°C), kills bacteria.

**Tell the names of bactericidal antiseptics**

- As antiseptics (i.e. germicide agents that can be used on human or animal body, skin, mucoses, wounds and the like)
- Iodine preparations, such as iodopovidone in various galenics (ointment, solutions, wound plasters), in the past also Lugol's solution,
- Peroxides such as urea perhydrate solutions and pH-buffered 0.1 - 0.25% peracetic acid solutions,
- Weak organic acids such as sorbic acid, benzoic acid, lactic acid and salicylic acid
- Some phenolic compounds, such as hexachlorophene, triclosan and Dibromol.

**Tell the name of protein synthesis inhibitor Drugs**

- Macrolides
- Chloramphenicol
- Tetracycline
- Aminoglycosides
- Clindamycin
- Linezolid
- Streptogramins

**Tell the name of bacterial cell wall inhibitor drugs**

- Penicillin
- Cephalosporin
- Carbapenem
- Monobactam
- Vancomycin
- Bacitracin

**Tell the name of bacterial cell membrane inhibitor Drugs:** Polymyxin.

**Tell the name of DNA synthesis inhibitor Drugs**

- Folate synthesis inhibitors
- Sulfonamides
- Trimethoprim

**Tell the names of DNA gyrase synthesis inhibitors:** Quinolones.

**Tell the names of RNA polymerase synthesis inhibitors:** Rifampin.

### Veterinary Parasitology

**Define parasite:** An organism that lives at the expense of its host.

**Define vector: Vector:** An agent and very often a biting insect that is responsible for the transmission of the disease.

**Acaricide:** Chemical substance having a cidal or lethal effect on the Acarida, a subclass of the arthropods to which ticks and mites belong.

**Adjuvant:** An additive to a vaccine in order to stimulate or potentiate the immune response. In experimental animals Freund's adjuvant is often used. In humans this is not allowed and as adjuvant BCG is often used.

**Anaemia:** Reduced number of erythrocytes or red blood cells often resulting by haemolysis due to the damaging action of intra erythrocytic parasites such as Plasmodium or Babesia or by immunological reactions due to the presence of trypanosomes in the circulation.

**BCG:** Bacillus Calmette Guerin of *Mycobacterium bovis*. The glycoproteins of the cell wall of this bacterium are a powerful adjuvant used as a constituent of a vaccine in combination with vaccinating molecules or cell preparations to stimulate the immune response.

**Congenital transmission:** Transfer of pathogens from mother to foetus via the placenta. In this case the fetus will be born infected.

**Ectoparasites:** Parasites such as lice and flies that live on the bodies' outer surface.

**Endoparasites:** Parasites that live internal parts of the body, such as trypanosomes or Ascaris worms.

**Facultative parasite:** Is an organism that may survive and dwell in the absence of a host but that occasionally infects a host organism.

**Haemolysis:** Lysis of red blood cells due to the damaging action of intra erythrocytic parasites such as Plasmodium or Babesia or by immunological reactions due to the presence of trypanosomes in the circulation.

**Haematophagous:** Bloodsucking, used for insects that need blood either as the major nutrient, or for producing fertilized eggs (female mosquitoes or sand flies).

**Host:** An organism that gives food and shelter to another organism (often a parasite).

**Infestation:** Contamination with parasites present on the outside of the host organisms, such as by ectoparasites or the contamination of a habitat with mosquitos.

**Infection:** Contamination with parasites present inside of the host organism, such as by malaria parasites or by schistosomes.

**Quartan fever:** Fever caused by malaria parasites with a periodicity of 72 hours.

**Relapses:** Spontaneous return of the parasitaemia and the disease symptoms after a period of apparent cure.

**Sylvatic:** From the forest or present in the forest.

**Tertian fever:** Fever caused by malaria parasites with a periodicity of 48 hours.

**Thrombocytopenia:** Condition where there is an abnormally small number of thrombocytes or blood platelets in the circulating blood.

**Therapeutic window:** Difference between the ED<sub>50</sub> (half-maximal effective dose) and LD<sub>50</sub> (half-maximal toxic dose), indicating the dose range in which the drug is active.

**Zoonosis:** A parasitic disease mainly infecting animals and occasionally humans. The animal host serves as the major parasite reservoir.

**Amoeba:** A single celled organism which has no rigid body structure. Amoebas move about and take in food by extending *pseudopods*. Examples of parasitic amoebae include *Entamoeba histolytica* (cause of amebic dysentery) and *Naegleria* sp. and *Acanthamoeba* sp. (causes of eosinophilic meningitis).



**Arachnid:** A group of arthropods normally featuring 4 pairs of legs and two major body segments (cephalothorax and abdomen). Parasitic arachnids include mites and ticks. The group also includes the spiders and scorpions.

**Arthropod:** A group of organisms comprising a whole phylum to themselves (Phylum Arthropoda). These organisms are characterized by having a number of jointed legs, numerous body segments which may be fused or unfused and a hard outer covering or exoskeleton made of chitin. Phylum Arthropoda contains the following Classes: Insecta (insects), Arachnida (spiders, mites, ticks, scorpions, etc.), Chilopoda (centipedes), Diplopoda (millipedes), and Crustacea (crabs, shrimp, lobsters, water fleas, etc. Related groups include the Onychophora (Peripatus, etc), the Tardigrades (water bears, etc.) and the Pentastomids (tongue worms).

**Cestode:** (See Tapeworm).

**Cilia:** Small beating hairs on the outside of cells. In complex organisms like humans and animals, these cilia may be found on cells lining the respiratory passages, where they help the flow of mucus. In simpler organisms they may aid in movement. Single-celled organisms which use cilia to move around are called *ciliates*.

**Commensal:** A commensal organism is one which lives within the body of another but does not normally cause any harm. In times of stress, commensals may turn into pathogens (see opportunistic pathogen).

**Cyst:** In parasitology, the term cyst may have two meanings. Firstly, a cyst may be the resistant dormant stage of a single-celled organism which is passed out and encourages the propagation of the species. Alternatively, cyst may refer to the intermediate stage of some tapeworms (e.g., hydatid cysts). This cyst must be eaten by the definitive host for it to be infected.

**Definitive host:** The definitive host is the organism which houses the mature or sexually reproducing stage of the parasite. For example, the dog is the definitive host of the hydatid tapeworm, while the mosquito is the definitive host of the malarial parasite.

**Diarrhea:** Frequency of bowel movements or stool often associated with a loose consistency.

**Dioecious:** Having two sexes (as opposed to hermaphroditic).

**Dysentery:** Diarrhea with associated blood and mucus discharge.

**Filarial worm:** A group of long, hair-like nematodes in which the adults live in the blood or tissues of vertebrates. In some species, the larvae may be found in the blood. Examples of diseases caused by filarial worms include Elephantiasis and River Blindness.

**Flagellum:** A long beating hair found on a cell which normally aids in movement. Human sperm cells have a flagellum. Single-celled organisms which move about using flagella are called Flagellates.

**Flatworms:** A group of organisms comprising a whole phylum (Phylum Platyhelminths). Flatworms have flat bodies (as the name suggests) and are normally hermaphroditic. Phylum Platyhelminths consists of three classes: Class Trematoda (the flukes), Class Cestoda (the tapeworms) and Class Tubellaria (the free-living flatworms e.g. Planarians and ribbon worms).

**Flukes:** A group of organisms characterized by having a flat, unsegmented body and complex multi-stage life-cycles. Flukes (comprising Class Trematoda) are members of the Phylum Platyhelminths, or the flatworms, which also includes the Tapeworms and the non-parasitic Turbellarians (e.g., the Planarians). Flukes are entirely parasitic, and are hermaphroditic, save for some groups (e.g., the Schistosomes). Examples of flukes include the liver fluke and the schistosomes.

**Geohelminth:** A worm which spends a certain time during its lifecycle living in the soil.

**Helminth:** (Please see Worm).

**Hermaphrodite:** A species in which one organism contains both sets of sex organs.

**Host:** The organism in which a parasite lives.

**Imago:** The last stage of development of an insect, after the last ecdysis (molt) of an incomplete metamorphosis, or after emergence from pupation where the metamorphosis is complete. As this is the only stage which is sexually mature, and has functional wings in winged species, the imago is often referred to as the adult stage. The Latin plural of imago is imagines, and this is the term generally used by entomologists - however imagos or imagoes are also acceptable spellings.

**Insect:** A group of organisms comprising the Class Insecta of Phylum Arthropoda. Insects are characterized by having 3 pairs of legs and three major body segments (head, thorax and abdomen). Some species have wings. Parasitic insects include the fleas and lice. Other groups, such as flies, mosquitoes and some beetles, are important vectors of parasitic disease or intermediate hosts.

**Intermediate host:** The organism which houses the immature or *non-sexually reproducing* stage of a parasite. For example, the sheep is the normal intermediate host for the hydatid tapeworm, while humans are the intermediate host for the malarial parasite.

**Larva:** An immature stage of an organism which bears no structural resemblance to the mature stage. For example, a maggot is the larva of a fly, a caterpillar is the larva of a moth or butterfly. Remember: A caterpillar is just a butterfly maggot.

**Nematode:** A group of organisms also known as the Roundworms. Nematodes have what can only be described as a typical "worm" shape - long, tapered at the ends and round in cross-section (think of the shape of an earthworm, but earthworms are *not* nematodes). They have an internal body cavity, with recognizable digestive and reproductive tracts. Nematodes are generally dioecious. They reproduce by laying eggs, or larvae which hatch from their eggs inside the body of the female worm. They are among the most common multicellular parasite of humans in the world, although the majority of nematodes are not parasitic, living in the soil. Examples of parasitic roundworms include Human Roundworm (*Ascaris*), Pinworm/Threadworm, Whipworm, Hookworm and Filarial Worms.

**Nymph:** An immature stage of an organism which largely resembles the adult stage, save for some minor differences. For example, cockroach nymphs can be differentiated from the adults by the fact that the nymphs do not have wings.

**Obligate parasite:** A parasite which cannot survive or reproduce outside the body of its host organism.

**Opportunistic pathogen:** An organism which is normally harmless (Commensal), but which may turn nasty if given the opportunity. For example, one of the dangers for people in the last stages of HIV infection is infection by any number of organisms which pose no threat to individuals with fully functioning immune systems.

**Paratenic host:** A host in which the parasite does not undergo any development. For example, dogs and pigs may carry hookworm eggs from one place to another, but the eggs do not hatch or pass through any development in these animals.

**Parthenogenesis:** A process which may occur in some sexually reproducing animals where offspring are produced without fertilization.

**Pathogen:** Any organism which causes harm to its host.

**Platyhelminths:** (Please see Flatworms).

**Protozoa:** A subgroup of the Kingdom Protista, or the single-celled organisms. The name *Protozoa* is a carry-over from an old system of classification and is generally used to describe those single-celled organisms which show more animal than plant characteristics. Naturally, such a distinction is meaningless, as animals and plants belong to completely different kingdoms, but in general, Protozoa refers to those organisms which do not carry out photosynthesis. Parasitic protozoa comprise a number of subgroups: The Sarcostigophora (amebas and flagellates), The Ciliates (ciliated organisms), the Sporozoa (malaria, *Toxoplasma*, *Cryptosporidium* and allies), and the Microsporidia.

**Pupa:** The “dormant” stage in the life-cycle of some insects where the larva changes into the adult (or *imago*).

**Roundworm:** (Please see Nematode).

**Ringworm:** A commonly mistaken term. Ringworm is the common name given to skin infections by certain fungi. The correct term is *Tinea*. The condition is not caused by a worm at all, and the name dates from a time where all ailments were blamed on worms of some description.

**Schistosomes:** A group of Flukes which live in the blood vessels of their hosts. Unlike most other flukes, the schistosomes are dioecious.

**Sporozoan:** A group of single celled organisms which are characterized by having a sexual and an asexual generation in their life-cycle. Examples of parasitic Sporozoans include the malarial parasites, *Toxoplasma* and *Cryptosporidium*.

**Tapeworm:** Name for the parasitic flatworms forming the class Cestoda. All tapeworms spend the adult phase of their lives as parasites in the gut of a vertebrate animal (called the primary host). Most tapeworms spend part of their life cycle in the tissues of one or more other animals (called intermediate hosts), which may be vertebrates or arthropods.

**Trophozoite:** The active or feeding stage of a single-celled organism.

**Vector and its types:** An organism which transmits a parasitic organism from one host to another. *Mechanical Vectors* merely carry the organism from one place to another (e.g. flies carrying feces on their feet), while other vectors may form a necessary part of the life-cycle (e.g. mosquitoes in malaria).

**Worm:** A multicellular organism which is generally longer than it is wide or deep. The scientific name for worms is *Helminth*. In parasitic terms there are three major groups of organisms which are properly called worms: The Nematodes, the Flukes and the Tapeworms. These and other sorts of worms may parasitize other organisms e.g., The Acanthocephalans (thorny headed worms) and The Gordians (horse-hair worms). Other sorts of worms are free living e.g., free-living nematodes, The Annelids (e.g., earthworms, polychaetes, leeches, etc.), Planarians (and other Turbellarians).

### Theriogenology and obstetrics

**Differentiate B/W sperm and semen:** Sperm and semen are not the same substance. Sperm cells are actually a part of the semen. Sperm leaves the body through the mix of bodily fluids that make up semen. This fluid contains fructose and proteolytic enzymes that facilitate the mobility of sperm outside the male reproductive tract.

**Sperm:** Sperm is the motile microscopic male reproductive cell which is transmitted into the female reproductive system through a process of sexual intercourse.

**Semen:** Semen refers to the seminal fluid that is whitish and viscous liquid released from the penis. The semen contains the sperm cells and other seminal plasma liquids which ensure viability of the fluid.

### Composition of semen and its pH

- Prostate glands
- Seminal vesicles
- Bulbourethral gland
- Semen is produced as a combination of secretions from the different regions of the male reproductive tract.
- Spermatozoa are produced in the testes. They mature in the epididymis. The testes also produce testosterone and inhibin.
- Seminal vesicles accounts for approximately 70% of semen volume. It is rich source of fructose in semen.

- The prostate gland supplies about 20% of the volume of semen. It is rich source of acid phosphatase and proteolytic enzymes that lead to coagulation and subsequent liquefaction of semen. Also source of IgA found in semen.
- The bulbourethral gland produces mucoproteins that make up about 5% of the volume of semen.
- A normal pH range of 7.1 - 8.0 but it has specified that normal range is 7.2 - 7.8. It is measured by pH meter or pH paper pH of bull semen is 6.5 - 7.2.

**Define the term sterility:** Sterility is inability on the part of the female or the male partner to produce any offspring.

#### **Causes of sterility in females**

- New growths - fibroids and cancer, etc.
- Sterility is also caused if there is any tumour in uterus or ovary.
- Prolapsus of uterus. Uterine displacement
- Hypertrophy of the cervix
- Irregularity of estrus
- Dysmenorrhœa
- Constipation
- Inflammation of vagina due to leucorrhœa
- Excessive and premature estrus
- Hard work (less of sexual passion)
- Sterility in female animal with excessive sexual desire
- Mental worries, grief
- Constitutional cause
- Sometimes sterility is due to the weakness of the uterus which is incapable of holding the fetus. This weakness of uterus is also common cause of abortion.
- Chronic diseases
- Other causes of sterility may be diabetes, ulceration of the os uteri, fibroid tumours and enlargement of the uterus.
- Endocrinal deficiencies. Obesity due to defective thyroid secretion.
- Atresia of cervix and rudimentary uterus.
- Partial stenosis of the tubes. It is associated with imperfectly developed uterus (almost an incurable condition).

**Rubins test:** Another way of test of the potency and permeability of the tubes is by introduction of a dye (lipoidol), injected into the uterus; a subsequent X-ray will not show only that the blocked tubes, but also the sites or place where they are blocked.

- Inflammatory conditions: such as endometritis, endocervicitis.
- Cystic ovaries or destroyed as well, due to tumors, etc.
- Vaginismus and Trauma to the parts.

#### **Causes of sterility in male**

- Impotency of long standing
- Short and curved penis
- Undescended or atrophied testes

- Defective seminal discharges: no sperms or undeveloped sperms or a few sperm non-motile sperms ; this may be due to some previous or present disease of the testes, like mumps, tuberculosis, gonorrhoea, syphilis, etc.
- Sexual neurasthenia and Semen thin and odorless.

Sperm production problems	<ul style="list-style-type: none"> <li>• Chromosomal or genetic causes</li> <li>• Undescended testes (failure of the testes to descend at birth)</li> <li>• Infections</li> <li>• Torsion (twisting of the testis in scrotum)</li> <li>• Varicocele (varicose veins of the testes)</li> <li>• Medicines and chemicals</li> <li>• Radiation damage</li> <li>• Unknown cause</li> </ul>
Blockage of sperm transport	<ul style="list-style-type: none"> <li>• Infections</li> <li>• Prostate-related problems</li> <li>• Absence of vas deferens</li> <li>• Vasectomy</li> </ul>
Sexual problems (erection and ejaculation problems)	<ul style="list-style-type: none"> <li>• Retrograde and premature ejaculation</li> <li>• Failure of ejaculation</li> <li>• Erectile dysfunction</li> <li>• Infrequent intercourse</li> <li>• Spinal cord injury</li> <li>• Prostate surgery</li> <li>• Damage to nerves</li> <li>• Some medicines</li> </ul>
Hormonal problems	<ul style="list-style-type: none"> <li>• Pituitary tumours</li> <li>• Congenital lack of LH/FSH (pituitary problem from birth)</li> <li>• Anabolic (androgenic) steroid abuse</li> </ul>
Sperm antibodies	<ul style="list-style-type: none"> <li>• Vasectomy</li> <li>• Injury or infection in the epididymis</li> <li>• Unknown cause</li> </ul>

**Table 8:** Causes of infertility in male [20,21].

**Common causes of abortion**

- Infectious agents
- Genetic abnormalities
- Heat stress
- Toxic agents

### Sources which cause abortion

- Fertilizer nitrites and nitrates or the nitrates found in plants under certain conditions (e.g. drought-stress). If a cow is exposed to sufficiently high levels of nitrates/nitrites (~.55% or greater nitrate in forage), abortions may occur, especially in late gestation.
- Some experimental studies have shown that mycotoxins such as zearalenone in very high levels can cause abortions in cattle.
- Ergot alkaloids are toxins produced by the *Claviceps* fungus, such as fescue, brome grass, wheat, oat and rye. These toxins have been associated with abortions in dairy cattle as well as other health problems.
- *Actinomyces pyogenes*, *Bacillus*, *Streptococcus* spp. and other common bacteria found in the environment can be the cause of sporadic abortions in a dairy herd.

**Define proven bull:** Using hundreds of thousands of mating records collected through data centers. If semen fertility values for a bulls is recorded with more than 400 matings and their progeny record is good then it is declared as proven bull. Semen fertility values relate to the ability of the bull's semen to get cows in calf.

### Proven bull qualities

- Bulls have higher conception rate
- Herd improvement service period
- Based on the fertility of their semen
- Calving ease (normal birth)

### What is best %age for sperm motility and describe its types?

60% is considered best for conception.

#### Types

- Straight moving,
- Zig-zag moving,
- Vibrating,
- Non-motile

**Time of insemination in bovine:** It is performed 16 hours after the estrous period (heat sign). 1 minute semen ejaculation through artificial insemination (A I) in the body of uterus.

**Standing heat:** Estrus, or standing heat, is defined as a regularly occurring state of sexual receptivity during which the female accept the male. This is indicated in cattle by the cow standing to be mounted by a bull or other cows.

**Repeat Breeding (R B):** Repeat breeders can be divided into two groups:

**Early repeats:** Cows that come into heat within 17 - 24 days after AI. In these cows the most probable event is either failure of fertilization (delayed ovulation, poor semen quality etc.) or early embryonic death (delayed ovulation, poor embryo quality, unfavourable uterine environment, precocious luteolysis)

**Late repeats:** Cows that come into heat later than 25 days after AI. Fertilization and initial recognition of pregnancy probably take place but for some reason (inadequate luteal function, inadequate embryo signaling, infectious diseases, and induced luteolysis). There is loss of pregnancy when luteolysis is induced.

**From animal side repeat breeding (R B)**

- Under feed animal
- Uterine infection
- Heat or other stress

**From male animal side**

- Poor quality semen
- Less sperm motility

**From veterinarian side**

- Inseminate at fornix vagina (neck of cervix)
- Inseminate outside body of uterus (for only 8<sup>th</sup> semester hmm)

**From former side**

- Misunderstanding of heat sign
- Late insemination

**Veterinary Anatomy**

**Define anatomy and why it is important?**

Anatomy is the identification and description of the structures of living things. It is a branch of biology and medicine.

The study of anatomy goes back over 2,000 years, to the Ancient Greeks. It can be divided into three broad areas: Human anatomy, zootomy, or animal anatomy, and phytotomy, which is plant anatomy.

Human anatomy is the study of the structures of the human body. An understanding of anatomy is key to the practice of health and medicine.

The word “anatomy” comes from the Greek words “ana,” meaning “up,” and “tome,” meaning “a cutting.” Studies of anatomy have traditionally depended on cutting up, or dissection, but now, with imaging technology, it is increasingly possible to see how a body is made up without dissection.

There are two ways of looking at anatomy: Gross, or macroscopic, anatomy and microscopic anatomy.

**Anatomical terms for describing planes**

**Median or Mid-Sagittal plane:** This is the plane which divides the body into equal right and left halves.

**Sagittal plane:** It is any plane parallel to the median plane. This plane divides the body into unequal right and left halves.

**Frontal plane:** It is a vertical plane at right angle to median plane. If you draw a line from one ear to another from above the head and then divide the whole body along this line, the plane formed will be frontal plane. It is also known as coronal plane.

**Transverse plane:** It is the horizontal plane of the body. It is perpendicular to both frontal and median plane.

**Oblique plane:** Any plane other than the above described planes will be oblique plane.

**Directional terminology**

These terms are essential for describing the relative locations of different body structures. For instance, an anatomist might describe one band of tissue as “inferior to” another or a physician might describe a tumor as “superficial to” a deeper body structure. Commit these terms to memory to avoid confusion when you are studying or describing the locations of particular body parts.

- Anterior (or ventral):** Describes the front or direction toward the front of the body. The toes are anterior to the foot.
- Posterior (or dorsal):** Describes the back or direction toward the back of the body. The popliteus is posterior to the patella.
- Superior (or cranial):** Describes a position above or higher than another part of the body proper. The orbits are superior to the oris.
- Inferior (or caudal):** Describes a position below or lower than another part of the body proper; near or toward the tail (in humans, the coccyx, or lowest part of the spinal column). The pelvis is inferior to the abdomen.
- Lateral:** Describes the side or direction toward the side of the body. The thumb (pollex) is lateral to the digits.
- Medial:** Describes the middle or direction toward the middle of the body. The hallux is the medial toe.
- Proximal:** Describes a position in a limb that is nearer to the point of attachment or the trunk of the body. The brachium is proximal to the antebrachium.
- Distal:** Describes a position in a limb that is farther from the point of attachment or the trunk of the body. The crus are distal to the femur.
- Superficial:** Describes a position closer to the surface of the body. The skin is superficial to the bones.
- Deep:** Describes a position farther from the surface of the body. The brain is deep to the skull.

### Basic anatomy terms

This medical billing terminology list will help you in understanding of the medical practice in general. Let’s look now at a few basic terms for the regions of the body. You might recognize some of them.

Word	Body Part
Abdominal	Abdomen
Buccal	Cheek
Cranial	Skull
Digital	Fingers and toes
Femoral	Thigh
Gluteal	Buttock
Hallux	Great toe
Inguinal	Groin
Lumbar	Loin (lowest part of the spine below the false ribs and between the hips)
Mammary	Breast
Nasal	Nose
Occipital	Back of head
Pectoral	Chest
Sternal	Breastbone
Thoracic	Chest
Umbilical	Navel
Ventral	Belly

Table 9: Basic terminology.

### Conditions

Now that we’ve taken a look at the terms that describe the major regions of the body, let’s turn to some conditions that may affect those body parts in this medical terminology list.



Prefix	Meaning	Example
Ambi-	Both	Ambidextrous
Dys-	Bad, painful, difficult	Dyslexia
Eu-	Good, normal	Eukaryote
Homo-	Same	Homogenous
Iso-	Equal, same	Isotope
Mal-	Bad, poor	Malnutrition
Suffix	Meaning	Example
-algia	Pain	Myalgia
-emia	Blood	Hypoglycemia
-itis	Inflammation	Bronchitis
-lysis	Destruction, break down	Dialysis
-oid	Like	Haploid
-opathy	Disease of	Neuropathy
-pnea	Breathing	Sleep apnea

**Table 10:** Basic terminology related to conditions.

### Surgical procedures

Let’s wrap up this vocabulary review with a look at some of the most common surgical procedures. Since it’s always imperative to list where on the body a surgical procedure was performed, these vocabulary terms are a small but useful addition to this section. Memorize this medical terminology suffixes list and you’ll know instantly what kind of procedure was performed, even if you don’t know exactly what the procedure did.

Suffix	Meaning	Example
-centesis	Puncture a cavity to remove fluid	Amniocentesis
-ectomy	Surgical removal or excision	Hysterectomy
-ostomy	A new permanent opening	Tracheostomy
-otomy	Cutting into, incision	Gastrotomy
-orrhaphy	Surgical repair or suture	Gastrorrhaphy
-opexy	Surgical fixation	Nephropexy
-oplasty	Surgical repair	Rhinoplasty
-otripsy	Crushing or destroying	Lithotripsy

**Table 11:** Surgical procedures terminology.

### Meat sciences

#### Composition of meat

Meat is defined by the Codex Alimentarius as “All parts of an animal that are intended for, or have been judged as safe and suitable for, human consumption”. Meat is composed of water, protein and amino acids, minerals, fats and fatty acids, vitamins and other bioactive components, and small quantities of carbohydrates.

Product	Water	Protein	Fat	Ash	kJ*
Beef (lean)	75.0	22.3	1.8	1.2	485
Beef carcass	54.7	16.5	28.0	0.8	1351
Veal (lean)	76.4	21.3	0.8	1.2	410
Chicken	75.0	22.8	0.9	1.2	439
Venison (deer)	75.7	21.4	1.3	1.2	431
Beeffat (subcutaneous)	4.0	1.5	94.0	0.1	3573
Milk (pasteurized)	87.6	3.2	3.5		264
Egg (boiled)	74.6	12.1	11.2		661
Bread (rye)	38.5	6.4	1.0		1000
Potatoes (cooked)	78.0	1.9	0.1		301

**Table 12:** Nutritional composition of meats and other food sources per 100g\*\* [22,23].  
 Note: \*\*Meat processing technology for small- to medium-scale producers; \* Kilojoules.

From the nutritional point of view, meat’s importance is derived from its high quality protein, containing all essential amino acids and it’s highly bio available minerals and vitamins. Meat is rich in Vitamin B12 and iron which are not readily available in vegetarian diets.

**Define meat quality and strategies to examination.**

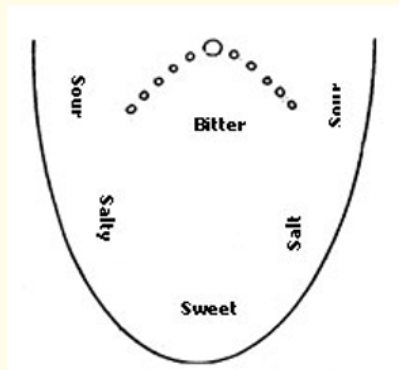
4 parameters of meat quality; pH, color of meat, water holding capacity and texture of the meat. For these parameters all they are affected by the way the farmer feed his/her livestock so that the customer is satisfied and for economic reasons.

In this chapter simple methods of

- Sensory evaluation
- Physical
- Chemical testing
- Microbiological testing

**Sensory evaluation**

Sensory evaluation is a common and very useful tool in quality assessment of processed meat products. It makes use of the senses to evaluate the general acceptability and quality attributes of the products.



**Figure 2:** Areas of the tongue where taste buds and reception areas for different tastes are located.

Sense of sight is used to evaluate the general appearance of the product such as colour, size, shape etc.

- Sense of smell for the odour
- Sense of taste for the flavor which includes the four basic tastes sour, sweet, bitter and salty
- Sense of touch for the texture either by mouth feel or finger feel.

### Physical test methods in meat processing

With physical test methods important parameters such as temperature, acidity (pH), water activity ( $a_w$ ) and water binding capacity can be determined. Other physical parameters are light intensity and mechanical testing for texture.

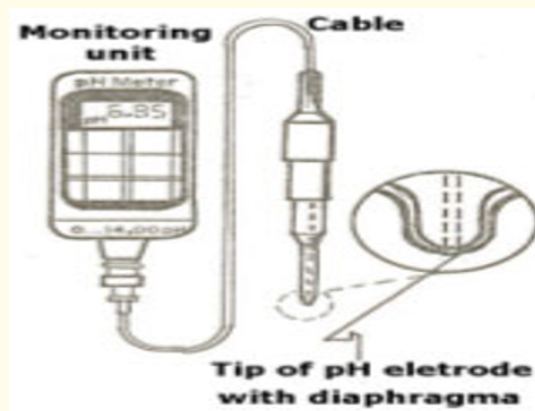
### Important temperature control points are

- Refrigerated rooms (freezer  $-18^{\circ}\text{C}$  to  $-30^{\circ}\text{C}$ , chiller  $0$  to  $+7^{\circ}\text{C}$ )
- Chilled meat ( $+4$  to  $+7^{\circ}\text{C}$ )
- Cutting rooms ( $+10$  to  $+15^{\circ}\text{C}$ )
- Curing rooms ( $+5$  to  $+10^{\circ}\text{C}$ )
- Water temperature in cooking vats ( $+75$  to  $+78^{\circ}\text{C}$ )
- Core temperature in meat products upon cooking/pasteurization (approx.  $+68/72^{\circ}\text{C}$ )
- Core temperature in meat products during sterilization (above  $+100^{\circ}\text{C}$ )
- Sterilization temperature in autoclaves (above  $+100^{\circ}\text{C}$ )

### pH meters

Portable instruments are battery driven and have glass electrodes. The pH-value in meat and meat products can be measured by direct contact between the sensitive diaphragm of the electrode and the meat tissue.

The pH is a measure of the acidity or alkalinity in solutions or water containing substances. pH values lower than 7 are considered acidic, while pH values higher than 7 are considered alkaline. A pH of 7 indicates neutrality. pH values are related to the concentration of hydrogen ions ( $\text{H}^+$ ) in the substance.



**Figure 3:** Portable pH-meter for direct measurement in meat.



**Figure 4:** pH meter; inserting glass electrode in meat tissue.

Product	pH value (range)
Meat mixes in jelly + vinegar added	4.5 to 5.2
Raw fermented sausage	4.8 to 6.0
Beef	5.4 to 6.0
Pork	5.5 to 6.2
Canned meats	5.8 to 6.2
Curing brines	6.2 to 6.4
Blood sausages	6.5 to 6.8
Muscle tissues, immediately after slaughter	7.0 to 7.2
Blood	7.3 to 7.6

**Table 13:** Typical pH values for meat and meat products [22].

**pH measurement is useful for:**

- Evaluation of meat quality for further processing, in particular the water binding capacity
- Control of ripening of raw fermented products, which is connected with drop in pH
- Control of acidity of ingredients such as brines, marinades etc.

**Hygrometers**

Hygrometers measure the relative humidity and are used in production and storage rooms of the meat industry.

<b>Meat boning and cutting rooms</b>	<b>45% to 60%</b>
Meat packaging rooms	45% to 60%
Chilling rooms	85% to 95%
Storage / ripening rooms for meat	70% to 85%
Ripening rooms for raw fermented ham and sausages	80% to 95% (depending on the stage of ripening)

**Table 14:** Recommended values for the relative humidity [22].

### **Simple methods of chemical analysis**

Chemical analyses to determine the content of protein, fat, water and minerals (ashes) of processed meat products are carried out to establish the nutritive and economic value of the products. Samples of the meat product are finely ground and weighed accurately for each respective chemical analysis.

The determination of the moisture content (or water content) is done by drying an appropriate amount of the sample. The difference in weight between the fresh and dried samples represents the water content. For rapid determination of moisture content a microwave oven is useful.

The protein content is determined at laboratory level by using the Kjeldahl method, where meat products are digested by acid to obtain the nitrogen compounds and then distilled and titrated to determine nitrogen quantitatively, with which the protein component can be calculated.

Determination of the **fat content** is the most complicated component of simple meat and meat product analysis, as analytical equipment (Soxhlet apparatus) is needed.

### **General Knowledge or information**

- Dairy and Rural Development Foundation (DRDF)
- SWOT analysis (SWOT matrix) is an initial for (strengths, weaknesses, opportunities, and threats)

### **OK abbreviation**

- Objection kills.
- The Greek words "Ola Kala" meaning everything is good.
- The word OK came from the USA, and is probably an abbreviation of orl korrek, a jokey spelling of 'all correct', that was used as a slogan during the presidential re-election campaign of Martin Van Buren (1782-1862) in 1840.
- Frontier Works Organization (FWO).
- *DOL (Drogowy Odcinek Lotniskowy*, lit "road airfield section").
- Wheeled all-terrain vehicle (WATV).

### **Please see name according to your country**

#### **Chief Executive Punjab Livestock and Dairy Development Board**

Maj. Gen.(R) Muhammad Ali Khan.

#### **Secretary Livestock**

Hamid Yaqoob Sheikh.

#### **Director General Livestock Extension**

Dr. Irfan Zahid.

#### **Vice Chancellor UVAS**

Prof. Dr. Tallat Naseer Pasha.

#### **Secretary Livestock and Dairy Development Department Punjab**

Dr Aamer Ahmed. Excise Director General Nasim Sadiq was transferred and posted as Livestock and Dairy Development secretary.

**Chief Minister Secretariat Additional Secretary Coordination**

Ahmad Aziz Tarar.

**Livestock and Dairy Development Secretary**

Dr Amir Ahmad was made an OSD. Housing Secretary Nasim Nawaz was given the additional charge of the post of Environment secretary. Hafizabad DCO Mansoor Qadir was made an OSD.

**Cooperatives department additional secretary**

Ghulam Husain Rao.

**Child Protection and Welfare Bureau Director General**

Muhammad Yasrib.

**Faisalabad Wasa Director Finance**

Sher Bahadur.

**Gujranwala Development Authority Director General**

Hasan Raza Jaffri.

**Bahawalpur Commissioner Office Director Development**

Iftikhar Rasool.

**Labour Welfare Director General**

Muhammad Salim Husain.

**Welfare Director General**

Qaiser Salim.

**Conclusion**

Livestock provide healthier food, work opportunity, economic, social status, and ensure environmental sustainability. But increasing global population causes food security issues. Thus, there is need to aware peoples in order to solve these threats on environment and human life which may reduce the challenges facing by animal industry. Due to lack of exams experience and current information, veterinary graduates cannot pass the commission exams which, in response veterinary expert cannot contribute to livestock sector. Therefore, our aim was to provide a guidebook for animal science and veterinary medical students; question and answer discussion for public service commission examination which may open various complication related to exams. This book may help students to better understand examination planning, examination scope, examination technique and timeliness which, in turn, may build students interest to play their role as veterinary doctor in livestock sector.

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