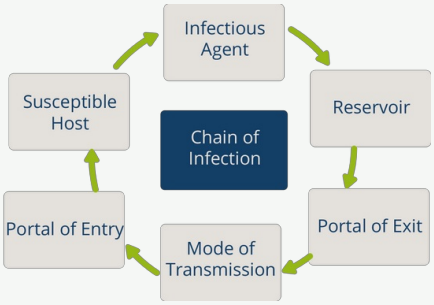
VETS1018 Professor Toan Cheat Sheet

by Rybak via cheatography.com/170879/cs/35815/

Introduction

60%	of **human infectious diseases** are **ZOONOTIC**
75%	of it is of **ANIMAL ORIGIN**
In **5** human diseases	**3 have an animal origin**
80% of **Bioterrorist agents**	**Zoonotic Pathogens**

Chain of Infection



Chain of Infection:
Starts with **Susceptible Host**

Field expertise and Knowledge Exchange

Experimental Knowledge (knowing what works and vice versa)		**Professional Knowledge** (professional conduct standards)
Land Manager	***Veterinarian***	**Scientific Knowledge** (Knowing latest technologies, techniques,..)
Experiential Knowledge (based on experiment interventions)		**Regulatory Knowledge** (Knowing legislations, laws, policies,...)

Pig diseases

-**PRRSv** (Porcine Reproductive and Respiratory Syndrome virus)
-**PCV associated diseases**
-**Foot and mouth disease**
-**ASF**(African Swine Fever)
-**Classical swine fever**
-**Swine Influenza**
-**Nipal virus infection**
-**Menangle virus infection**
-**Reston Ebolavirus infection**

Role of Veterinarian

As frontline of:
-**Detection** of animal diseases
-**Prevention** of animal diseases
-**Treatment** of animal dieases
Many are zoonotic

Normal role of veterinarian:
-Work to keep the animal **healthy** and **treat diseases**
-**Conduct research** to:
(1) Develop improved:
+Vaccines
+Diagnostics
+Therapeutics
(2) Serving as public health professionals

Role of Veterinarian (Cont.)

Clients and the public expect Veterinarians to:
-No matter what their responsibilities
-Must be knowledgeable about emerging and exotic diseases

• **Animal health**, **human health**, **food production**, and the **environment** are inextricably **linked**.
• The multidisciplinary training that veterinarians receive provides the tools needed to play an important role in meeting the challenges.

Role of Veterinarian (Cont.) (2)

Definition of health

State of **physical** and **psychological** well-beings that enables animals to express its genetic potential for maximising:
-**Productivity** performance
-**Reproductive** performance
-**Lean meat production**

Definition of Disease

Having a disorder of a body structure or function, one that produce **clinical signs** of a specific location, instead of just being a direct result of a physical injury.

Disease is associated with:
- An **unhealthy state** of body and mind
- Accompanied with pain and uneasiness
--->Unable to exert full genetic potential --> Decreased productivity

Disease (Cont.)

Clinical Disease Level is described by the term: **MORBIDITY**
Disease can have:
- **Clinical** (Showing external clinical signs)
- **Subclinical** (Not showing any obvious signs)
-->**Subclinical Disease** can lead to lowered productivity if goes unnoticed.

Clinical vs Subclinical

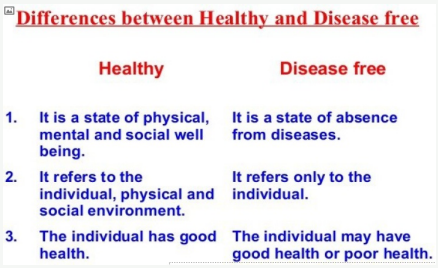
Clinical	***Subclinical***
Definition: *Diseases in the stage with observable abnormalities in a body structure or function of the patient, seen by the client or veterinarian.*	Definition *Diseases in the stage that have no observable abnormalities in the body structure or function*
- Are customarily graded: + Based on **severity**: Severe, Mild, Moderate, etc... + Based on **speed of onset** and **disease progress**: Peracute, Acute, Subacute, Chronic, etc...	

Every **healthy herd** at least **carries** a multitude of **potentially infectious pathogens** in: **Guts**, **Respiratory**, **Skin**, **Genitals**.

Veterinarians can contribute by:
- **Maintaining** and **improving** the **health and welfare** of food producing **animals** in the developed and developing world
- **Providing health care** to **prevent** and **control zoonotic diseases** in companion animals
- **Controlling food borne** and **zoonotic diseases** in food producing animals
- **Conducting research** for **improved vaccines, pharmaceuticals, and diagnostics**
- Working to **ensure** the **health of wildlife** and **maintaining biodiversity**
- Working to **reduce** the **impact** of **livestock, poultry, and aquatic** animal **production on** the **environment**
- **Improving** the **health** of **aquatic** animals, **exotic** animals and **zoo** animals. - **Educating students, animal owners**, and the **public** regarding these **critically important issues**.

However, it **isn't pathogenic enough** to cause **clinical** or **subclinical** diseases.

Health vs Disease-free



Differences between Healthy and Disease free

	Healthy	Disease free
1.	It is a state of physical, mental and social well being.	It is a state of absence from diseases.
2.	It refers to the individual, physical and social environment.	It refers only to the individual.
3.	The individual has good health.	The individual may have good health or poor health.

Pathogens and Immune system

There is a delicate balance between the potential infectious pathogens and the responsiveness of the immune system.

Pathogens > Immune System: Immune is impaired --> Pathogens can causes diseases

Pathogens = Immune System: Pathogens can reproduce, causing a local infection but are killed off quickly

Pathogens < Immune: The system over-r-eacted to a specific pathogen, having inappropriated immune responses --> Hypersensitivity

Physical or **Psychological** disturbance (disorder) can affect the equilibrium of these two --> Maintain good physical and mental health as to not impair the system.

Good animal husbandry and stockmanship

Good animal husbandry

Definition:

A branch of agriculture concerned with many aspects of food production animals.

--> **Good animal husbandry** is good housing, good nutrition and good manage-ment.

Good stockmanship

Definition:

A branch of science concerning the handling of animal's welfare and well-being

--> **Good stockmanship** is good handling of the animal in a safe, efficient, low-stress manner, prioritizing their health and welfare.

Pathogens and Immune system (Cont.)

The balance is more precarious when upscaling from an individual to a herd.

Poor husbandry would cause infection in a small groups, the pathogenic organisms gradually build up in the herd to a certain concentration that can infect even resilient ones.

The concentration continues to build up and destroy the balance, threaatening to overwhelm the collective herd immunity.

Host/Agent/environment Triangle

Agents

exposure to specific pathogens and their characteristics

Host

Age, breeds, sex, welfare,..

Disease

Enviro-nment

Husbandry methods, climate, hosuing,...

Animal behaviors

Healthy	Unhealthy
- Interact with one another - Curious - BAR (Bright, Alert, Responsive) - Show interest when disturbed - Observe respiratory rate	- Lethargic (move slowly) - Depressed (Head drops low, ears droop) - Isolate from herd, bumped by pen mates - Inactive - Not interested in eating/drinking - Decreased BAR manner

Bacteria

- Readily **observed under microscope** (especially when **stained**)
- **Recognized** by their **family group** using:
+ *Shape*
+ *Size*
+ *Antigenic characteristics*
+ *Biohemical characteristics*
+ *Identification of DNA*

Virus

- **Smallest** of the **infectious agents**
- Can only be **seen** using **electron microscope**
- Use **vaccines** to **artifically acquire active immunity**

Why viruses mutate more than bacteria?

Virus mutates as part of natural replication. During replication, it may undergo "copying errors" (genetic mutations), which keeps gradually happening, eventually lead to alterations of the virus' surface proteins or antigens.

Fungi

Definition:

Eukaryotic organisms, including **molds** and **yeasts**, also mushroom.

Characteristics:

- Found in damp conditions: badly stored cereals, moist places,...
- Produce **Mycotoxins** during **Multiplication** in **some species** --> ***Causes clinical signs if eaten***.

Fungi (cont.)

Methods to not grow *fungi*:

- Do not store moist corn or cereals	- Check holding bins (for feeds) for leakages and bridged feed monthly
- Do not let grain ferment	- Do not let feed to waste ad fermentation happening in feed troughs

Fungi (cont.) (cont)

- Check feed hoppers daily	- Always examine basic feed ingredients
- Empty grain bins regularly.	- Visually check the final feed prior to feeding

Fungi (cont.)

Example Diseases:

Certain species of *fungi* called **Dermatophytes** can cause skin infection on and development of ringworms.

--> **Dermaphytosis**

Question: How to detect fermentation is happening?

- pH test: 4.6 or below

Parasites

Definition:

-Live inside body: **Endoparasites**

- Live externally on or in the skin: **Ectoparasites**

Characteristics:

- Smallest parasites: **Coccidia**: --> **Coccidiosis** (Bệnh Cầu Trùng): They live in intestine (**the lining of smaall intestine**)

- Have a life cycle: from eggs to larvae to adults

- Some parasites require intermediate host, such as lungworms use earthworm as intermediate.

Why should we know about a virus life cycle?

A virus life cycle is **the duration of living of the parasite**

When clinical signs appear, that means the parasites must haave been in the host for most of its life cycle. (Already an adult parasite).

Why should we know about a virus life cycle? (cont)

Example: A parasite with a 1-week life cycle --> **Infect an individual host** --> Host shows signs at week 3 --> Use parasiticides on week 2 of other cows

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Know the specific stages of life cycle to effectively prevent the parasite

The most effective and easy ways to break the cycle is to:

- **Have good hygiene**
- **Remove intermediate host if present**

Trauma

One of the major causes for diseases to develop inside body.

- **Traumatized individuals** are previously affected by **extrinsic factors** such as:
- Housing managements
- Other animals of same species
- Fighting
- Poor management techniques

Most are preventable with **good management**

Hereditary and Congenital

Hereditary and **Congenital** diseases are **common** in swines and cover a whole range of conditions.

What is the different between **Hereditary** and **Congential**?

Hereditary	Congenital
Meaning the condition was **inherited** from the **parents to the offsprings.**	Meaning the condition is **present at birth** but implying there was an **abnormality** happened **during fetus development** instead of being inherited.

Environmental problems

Environmental problems:

- Littering
- Contaminating surroundings with bacteria/chemical residues/...
- Releasing greenhouse gases

--> **Contribute to some disease developments**.

Do PLF (Precision Lifestock Farming):

- Effectively reduces:

+Ammonia, Greenhouse gases, Nitrates, Phosphorous, heavy metals, antibiotics.

- Effectively increases:

+ Good health
+ Good well-beings
+ Good productivity
+ Good reproductive performance.

Cancer

- Happens when some cells don't die and continue to grow abnormally.

Pressure of the abnormal growth put on other body parts --> **cannot function normally when being pushed** --> Illness occurs

-Affected body parts also cant function properly --> Failure --> Illnessz

- Can also cause fever and other conditions

Nutritional Deficiency and Excesses

- Knowledge on **Nutritional requirements** and **Components of dietary ingredients** helps **reduce problems relating to faulty nutrition**.

- Four aspects in diet that **deficiency** affect: vitamin, protein, minerals, energy

Vitamin deficiencies can cause poor growth;

Mineral deficiencies are **not uncommon** due to demands for increased lactation

**Nutrional excesses can also causes illness.

Metabolic Diseases

An upset (dysfunction) in the body functionings, usually caused by **intensive animal production**

Ex: Hypercalcemia

Allergies

- A part of Hypersensitivity
- Caused by an allergen
- Makes immune system attacks parts of the body

Poisoning

- Common in animals
- Caused by a variety of agents (including rotten feed)
- Many substances (such as drugs) can have **lethal dose**, meaning reaching a toxic--inducing level and cause illnesses.
- Poisoning can affect individually or together with others.

Stress

Definition:	Stress would cause:
Caused by interaction with adverse managements and environments.	- Impairment to digestive system
Good management will increase well-beings and biological efficiency of the animals.	- Increased secretion of stress hormones: corticosteroid suppresses immune system
	- Increased body temp. and heart rate
	--> Increased risk of diseases

Transmission

3 principle reasons for transmission of diseases:	**2 Types of transmission**:
- Poor sanitation	**Horizontal**: From 1 animal to another
- Improper management	**Vertical**: From parents to offsprings
- Introduction of a foreign animal to the herd	

Eight good management practices

- Isolate soon-to-be added animals for 3 to 4 wks before adding to the herd. (**Both new animals, cull animals and those exposed to other animals**)
- **Install** good **immunization program**
- **Clean, healthy environments** are provided
- **Adequately nutritious rations**
- **Visitors** and **new animals not allowed** in **livestock areas**
- **Quickly** and **accurately diagnose diseases**
- **Consult a veterinarian** when problems arise
- **Handled livestocks properly**