



Environmental Hygiene

Animal houses and sanitation



Introduction

➤ The word “sanitation” means the science of safeguarding health

➤ **Environmental sanitation:**

“It embraces the control of all those factors in man’s (in our context animals) physical environment which exercise a deleterious effect on the physical development (to productivity), health & survival”

(World Health Organization)

➤ **The physical environment**

The non-living objects & physical factors affecting the animals,
viz., air, ventilation, lighting, noise, climate & water



➤ In fact, the term sanitation covers the whole field of controlling the environment of animals with a view to prevent disease & promote health

Problems in the maintenance of sanitation in animal houses

- The lack of awareness
- Poverty
- Problems of safe water supply
- Disposal of excreta



River outfall



Water requirements for animals /animal houses

| Animal | Water requirement |
|---|--|
| Dairy cows & buffaloes <ul style="list-style-type: none">▪ For maintenance purpose:▪ For Milk production:▪ For washing & cleansing of cow-sheds, animal themselves, utensils an average of another | 110 lit. water/ cow 28 lit. /d Additional 3 lit. /each lit of milk 45-70 lit./cow |
| A horse Under average stable-feeding purposes Washing and other general purpose | 36 lit. of water 36 lit. of water |
| Sheep and goats an average daily allowance | 18 lit./d/ head |
| Pigs For all purposes | 40 lit. /d/head |
| Hens an avg. 100 hens | 20-30 lit. /d |

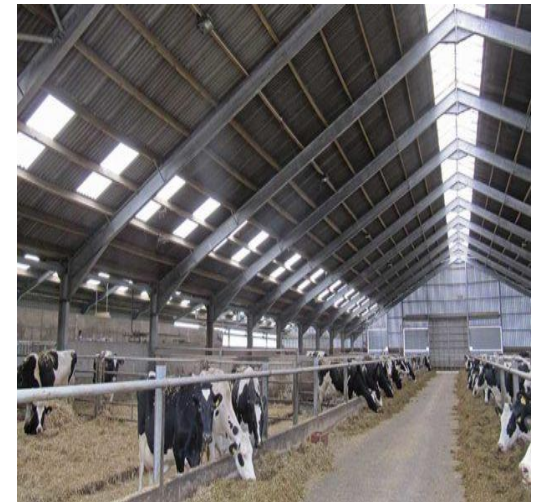


Objectives of sanitation

1. To establish hygienic atmosphere & structures
2. To create conditions for comfortable living of livestock (including poultry & ducks) so that they may remain healthy & productive

Requirements of livestock buildings

- Prime important in maintaining good sanitation
- Farm livestock are homeotherms: maintain a thermal balance between the heat they produce or gain or lose it from the environment
- The heat produced & released by the body: working efficiency & production
- **Small amount of heat is lost:** excretions & secretions
- **Main heat losses:**
 - Radiation,
 - Convection: **temperature of air/surrounding, humidity, movement of air**
 - Conduction
 - Evaporation



Factors effecting growth and productivity of animals

► Temperature

- Regulation at extremes of temperatures
- **Thermo-comfortable zone:** optimum production
- Allow animals to make their own zone: huddling or separation
- **Development of such zones depends:** age, sex, species, weight, feeding rate, acclimatization, husbandry system

► Relative humidity (30 to 90 %):

- Allows the livestock to thrive well
- Proper ventilation to maintain ventilation

► Air movement

- ## ► Air temperature
- above & below body temperature tend to reduce dissemination of body temperature & compels animals through more exercise, more feed intake & sufferings



Thermo-control in piggeries

- ▶ Pigs regulate the production of heat at some cost in terms of food energy
- ▶ **Intensive pig houses:**
 - Designed to ensure the best feed conversion efficiency by regulation of temperature & ventilation
 - Optimal efficiency of production increases
- ▶ The optimum temperature range for adult pigs ranges: **4- 30°C**



Thermo-control in ruminant houses

► The comfort zone

- European cattle: 0- 200C
- Jersey – Fresians: 20- 250C,
- Brown Swiss: 30- 320C
- Tropical cattle-38⁰C
- European – tropical crossbreds : 30⁰C

► Management of thermal control:

- Provision of appropriate sheds,
- Wallows
- Artificial shows ameliorate the effect of high temperature
- In loose housing system: open fronted barns,
- protection from solar radiation
- maximum provision of air movement

Large ruminant housing

- **Construction of environmentally controlled house:** high standard of thermal insulation of all surfaces round the animals – the floor, walls, roof, doors & windows
 - Traditional farm buildings without thermal insulation are common in most organized farms & rural areas
- Construction of farm buildings primarily to **floor, walls & roof**
- **Materials for wall construction:**
 - Strength,
 - Thermal insulation &
 - Method of construction (in relation to hygiene)
 - The surface should be smooth, impervious with minimum of places allowing dirt accumulation

Large ruminant housing

The floor:

- The animals stand, exercise, move, lie down & excrete
- It is critical to thermal physical comfort, health & security
 - **Should be** non-slippery,
 - well drained,
 - Comfortably soft,
 - Warm & dry,
 - Easy to clean mechanically
 - **Floors with drainage channel** covered with a removable metal grid
 - **Design of stalls & mangers:** easy consumption of food & less food wastage
 - **Edges & crevices:** should be avoided
 - **wall to floor junctions** should facilitate brushing & washing



Large ruminant housing

The roof

- Can be clad with corrugated asbestos or metal sheeting for uniform internal temperature
- Damp-resistant hard board or flat asbestos sheets can be used as loft seal

Bedding: concrete floor with straw or other bedding

- Reducing heat loss, make it comfortable,
- Provide desired warmth to milking cow & prevent injuries
- Clean and dry
- Soiled portions should be renewed regularly



Large ruminant housing

► **Cleaning of the yard is utmost importance:**

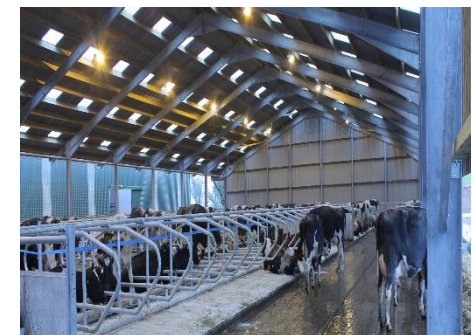
- Slurry & other organic matter should be scrapped properly
- To prevent foot trouble in animals
- **Dirty ramps tend:** become slippery create risk of fall & injury

► **Fly control:**

- Periodic spray of an appropriate repellent in dry shed
- Wire-netting in the building at a desired height (wall to roof): prevent birds & insects entering & disturbing the animals

► **Lighting arrangement:**

- Particularly during night & early morning hours,
- Availability of adequate natural light



Calf housing

- **Should be in two units**
 - One for very young & another for the older ones
 - It will facilitate disinfection & adequate rest
- Individual pens with solid partitions are preferred for calves bought from outside so as to prevent the risk of disease
- **Roof lighting:** light emitting through a double thickness glass or artificial lighting can be provided



Sheep housing

- Building with generous air space, i.e., climatic housing
- Sheep require a cover to protect from elements
- Sheep fleece provides **excellent thermos-insulation**
- Shearing the ewes necessitates good quality housing so as to minimize the risk of suffering from cold & draught
- Huddling of sheep together in the absence of fleece increases the danger of respiratory and skin diseases in adults and enteric diseases in lambs
- Adults sheep can withstand in temperature range of -7 to 30°C



Poultry housing

- ▶ The problem of sanitation in poultry houses is tackled from different angles, viz., temperature & humidity requirement, Provisions of lighting & watering

Temperature:

- ▶ Brooder temperature: 35⁰C (optimum for one day old chicks)
 - reduction of 0.5⁰C daily until a level of 18-21⁰C is reached
 - The change should be steady with reduction uneven air temperatures
- ▶ Broilers house temperature: 18-21⁰C or slightly lower (13 to 16⁰C) would be ideal
 - This can be achieved by increasing ventilation & by use of fans for affecting enhanced air velocity
 - For intensively kept layers, the optimum temperature for productivity and health is about 21⁰C

Relative Humidity:

- Maximum of 75% is acceptable
- Below 50% (critically if less than 30%): aggravate infections and disseminate contagions

► Proper lighting:

■ Development of reproductive organs & egg production

- A maximum of **18 hours/day** of lighting is 49 weeks onwards in case of layers
- The lighting system with dimming device: provide sufficient & even intensity of light to each bird
- It can be produced by suspending an ordinary bulb with a reflector at a height of **3 meter** at the center of the house
- The reflector would keep the bulb dust free

