Animal Nutrition

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Nutrition

Nutrition is defined as the process of providing and obtaining the food necessary for the health and growth of animals.

Why is Nutrition Important

- If animals don't have proper nutrition, their growth rate, reproduction rate, immunity, and well-being are all affected.

Why is Nutrition Important

Nutrition is important for a variety of reasons.

Animals need the proper nutrition for maintenance, growth, yield (meat, milk, egg….) and to provide energy for work and vital functions

Nutrients are utilized as the main energy source by an animal via various processes, including digestion and absorption in the digestive tract, blood transport, and metabolism in the cells.

Why is Nutrition Important

- Without proper nutrition,
- Animals can develop health and reproductive problems, which could result in treatment costs or even fatality.

- Profitability**

Nutrient

Any feed constituent or group of feed constituents of the same chemical composition that aids in the support of life and makes it possible for animals to grow or provide energy for physiological processes.
(Morrison, 1959)

Food, or any nourishing substance assimilated by an organism, and required for growth, repair, and normal metabolism

Digestible Nutrient

The portion of the nutrient which may be broken down (digested) and absorbed and used by the body.

- Feed- Feedstuffs: contain the substances that are the nutrient requirements of animal
- Ration: Mixture of feedstuffs to meet Daily (24h) nutrient requirements for the target animal
- Diet: refers to all feedstuffs consumed by the animal over time

Nutrients

- Water
- Protein
- Carbohydrates
- Fats
- Minerals
- Vitamins

WATER

- Water is an essential nutrient which is involved in all basic physiological functions of the body.

- Livestock considerably require larger quantities of water relative feed daily.

- **EXTREMELY IMPORTANT**
- Water availability and quality
- Water consumption

WATER

- Limiting water availability to livestock will depress production rapidly and severely, and if drinking water is of poor quality, production and health will decline

WATER

- Over 70% of the animals body is composed of water
- A loss of 20% will result in death of the animal
- Animals generally need about 3 lt of water for every kg of solid feed (dry matter) they consume
- Some water comes in the feed itself, such as in green pasture forages and silage.

Water

- Functions
- Transportation of nutrients and excreations
- Chemical reactions and solvent properties
- Body temperature regulation (Cooling the body by evaporation)
- Maintains shape of body cells.
- Lubricates and cushions joints and organs in the body cavity.

Water

- Animal's water needs change.

- 1. Environmental temperature - humudity
- 2. Dry matter consumption-Feed intake
- 3. Dietary factors: High water content of feed reduces drinking
- High fiber, salt or protein content of diet increase drinking
- 4. Physiological stage: lactation, pregnancy
- 5. Type of urinary system
- 6. Water quality
- 7.Activity level

Water

- Deficiencies:
- Reduced feed intake
- Weight loss due to dehydration
- Increased excreation of nitrogen and electrolytes such as sodium and potassium

Water content of animal body

Hayvan türleri	Crude fat	Fat free fresh material	Water	Water in Fat free fresh material
Calf at birth	3	97	74	76
2 months	15	85	65	76
6 months	7	93	69	74
1 year cattle	13	87	64	74
Mature cattle	18	82	59	72
Fattened beef	38	62	44	70
Lamb	32	68	53	78
Sheep	24	76	50	67
Horse	17	83	60	72

Water Quality

- Six criteria considered in assessing water quality

- 1-Odor and taste: *organoleptic* properties

- 2. pH: 6.8-7.5
- salinity (refers NaCl content),
- total dissolved solids,
- total dissolved oxygen and
- hardnes (Mg and Ca):

} *physiochemical* properties

Water Quality

- 3. Chemical contaminants, heavy metals, toxic minerals, pesticide, herbiside

- 4.Nitrate, nitrites and sulphate:nitrate-N max 100ppm
- nitrite-N: max 10 ppm
- 5. presence of bacteria:
- Coliform (MPN)
- 0: satifactory,
- 1-8: unsatisfactory
- > 8 unsafe
- (Based on water for human consumption)

Water quality testing

- It is important to stress that water quality may change over time, and therefore one should not rely on past analysis.

- Water testing should be done routinely, preferably every year, or at least every 2 years under normal circumstances

Water quality testing

- Testing should be done for;

- pH
- Nitrate
- Coliform bacteria
- Total bacteria

Element levels in drinking water and effects (ppm)

	NO_3 Nitrate	Mg Magnesium	Ca Calcium	SO_4 Sülphate	Na Natrium	Cl Chlorine
Safe	0-45	30	50	75	30	0-70
Mildly problems	45-100	0-60	50-80	75-150	30-50	70-150
Moderately problems	100-200	60-90	80-100	150-300	50-150	150-300
Unusable	>200	>90	>200	>300	>150	>300

Amount of total dissolved solids (TDS) in the water

Level in water (ppm)	
>500	Not usable for human consumption
<1000	No risk to livestock
1000-2999	Mild diarrhea
3000-4999	May cause diarrhea and temporary refusal of water
>5000	Not suitable for poultry