Animal Nutrition

UNIT-IV (NON-RUMINANT NUTRITION)

UG Lecture: 1-2

Feeding of Equine (Foal, Yearling, Brood Mare, Stallion & Race Horses)

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UG Lecture: 1

Objective……..

- Learn about the feeding of horses according to their physiological status and work level.

FEEDING OF HORSES

Some important points that are to be considered while feeding horses:

- If a horse has been well bred, is well trained and managed, is in good health and lives in a suitable environment, then nutrition will be the main factor influencing its performance.
- Generally, horses undergoing only limited activity or light work are fully nourished by good quality pasture.
- However, variable nutritional value of pasture, horses might not get enough nutrition from grazing, and need a supplement.
- Supplemental feed should be aimed to meet horse's nutritional needs that not available from the grazing.

- When horses do not have access to grazing, a well-balanced ration needs to be supplied.
- When grazing is adequate, the addition of minerals and vitamins to the diet is not usually necessary.
- However, mineral/vitamin supplement may be necessary, if roughage quality is poor.
- Salt should be supplied freely to working horses because considerable quantities are excreted in sweat.
- The provision of salt blocks or rock salt in feed boxes will help ensure adequate intake.

Feeds for horses

- **Roughage (hay or grasses) and concentrates (grains, grain by-products and oil cakes) are common feed.**

Dry Matter Intake

- The dry matter intake of horses is 1.5–2.5% of their body weight per day

Roughage and concentrate requirements of horses		
Type of work	Feed per 100 kg live weight	
	Roughage (kg)	Concentrate (kg)
Ideal	1.5	Nil
Light (2 hours/day)	1.25–1.5	0.5–0.75
Medium (2 hours/day)	1–1.5	1.0
Heavy (4 hours/day)	1.0	1.0–1.5

Feeding management of horse

- See the individual horse feeding habits, and adjust rations accordingly.
- Working horse total ration should be fed thrice per day.
- Feed a quarter of the concentrate requirement at morning and mid day remaining half at night.
- Reduce the amount of concentrate by 50–70% on non-working days of horse.
- Make any changes in the ration gradually over a period of 10–14 days.
- Keep feed and water troughs clean, and remove leftovers.
- Don’t allow a horses to drink large quantities of water immediately after exercise.
- Allow the horse to drink only 2–4 L, and then let it cool before allowing free access.
- Avoid working the horse on a full stomach & allow at least 2 hrs for digestion.

FEEDING FOALS

- Feeding of foals is according to its age.
- Mare milk can meet the requirement of foal up to the first 3 months age.
- Composition of mares milk:

  Fat - 1.25, Crude protein - 2.1%, Lactose - 6.3%, Ash - 0.4% & Gross energy - 480 Kcal/kg.
- Colostrum feeding provides immunity to the foal.

Feeding orphan foal

- Foal can be injected with horse serum for immunity.
- Fostering or hand rearing by bottle or bucket feeding can be carried out.
- Modified cow milk - cow milk 600 ml + 150 ml lime water + 1 spoon sugar.
- Frequency of feeding once in 2 hours- first two weeks, once in four hours - next two weeks and four times a day feeding upto weaning.

Creep feed for foal

- **Beyond 1 & half month additional creep feed can be provided.**
- **Creep feed should provide 75 % TDN and 16 % crude protein with highly digestible ingredients.**
- **It can be fed @0.5 to 1 % of the foals body weight.**

Creep feed composition

Ingredient	Percent in feed
Oats groats rolled	15
Flaked oats	20
Flaked maize or sorghum	35.75
Soy bean meal	15
Skim milk powder	5
Molasses	5
Di-calcium phosphate	2
Ground limestone	0.75
Mineral mixture	1
Vitamin supplement	0.5

FEEDING OF YEARLINGS

The following is the feeding schedule for yearlings

- ***3- 6 months*: 500 gm grain or concentrate mixture & 1 Kg good quality hay.**
- ***6-9 months*: 1 kg grain or concentrate mixture & 2-3 Kg good quality hay.**
- ***9-12 months*: 2 kg grain or concentrate mixture & 4-5 Kg good quality hay**

Concentrate mixture for yearlings

Ingredient	Percent inclusion
Crushed oats	25
Flaked maize or barley	30.8
Crushed sorghum	15
Soy bean meal	15
Alfa alfa meal	5
Molasses	5
Vitamin supplement	0.7
Dicalcium phosphate	2
Ground limestone	0.5
Mineral mixture	1

Discussions……..

Questions, if any……??

THANKS

UG Lecture: 2

Objective……..

- Learn about the feeding of Stallion, Mares and Race horses of different physiological activity & work conditions.

FEEDING OF STALLIONS

The feeding of stallion is critical for its breeding performance.

- **Amount of energy required by the stallion during the act of mating is quite small, but for additional physical activity & psychological response to breeding, increases the dietary energy needs.**
- **During the breeding season, more energy-dense feeds (grains) to be included in the ration to meet the stallion energy requirements.**
- **Vegetable oil can also be used to provide extra energy which can reduce the inclusion of large amounts of grain.**
- **Stallion should be fed high quality hay at a minimum level of 1.0 % of BW.**

- Stallions, used to mate many number of mares will require energy-dense grains @0.75 kg/100 kg BW.
- Other nutrient requirements also increase during the breeding season.
- Providing a suitable vitamin/mineral supplement.
- If stallion already receiving balanced diet then adding extra feed or supplements to the diet will not enhance fertility.
- Stallions that exercised regularly should be fed according to their level of work.
- After breeding season maintain on maintenance ration by increasing the hay portion and decreasing the grain portion of the ration.

FEEDING OF MARES

Feeding of mares should be carried out according to its physiological status.

- **Nutrients such as energy, protein, minerals (Ca, P, Mn, Cu, Zn & I) and vitamins (A, D & E) are important for the pregnant and lactating mare.**
- **Good quality pastures or hays can meet the nutrient requirement of mares.**
- **Grain can supplemented when more energy requires or if poor hay quality.**

Feeding pregnant mares

- During early to mid-gestation the nutrient demands of the developing fetus are minimal.
- Growth of the foal ranges 90 to 220 g per day, therefore, the mare's nutrient requirements in early to mid-gestation are similar to maintenance ration.
- During late gestation the foal is growing @350 to 450 g per day so, to support this growth, the mare's energy & protein requirements increase.
- Foetal uptake of minerals is greatest during the last trimester, hence, dietary Ca & P requirement increased substantially.
- Elevated energy & protein requirements of a mare in late gestation can be met by increasing the amount of mixed hay of leguminous species & grass.
- Adequate intakes of minerals and vitamins are also provided.

Feeding of lactating mares

- Mare at time of lactation should have a good body condition.
- Underfeeding mares during lactation can lower milk production, ultimately affecting the growth of foal.
- A thin body condition will also decrease the mare's ability to be re-bred.
- In addition to its own needs, mare produce 2 to 3% of her BW/day as milk.
- The energy and protein requirement increase 75 to 100 per cent.
- Lactating mare needs 3 times more calcium & 2.5 times more phosphorus as needed in early gestation.
- When fed grass hay alone then supplements the protein, energy & MM.
- The mare's nutrient requirements decline in the 4^{th},5^{th} & 6^{th} months of lactation, as milk production declines.

FEEDING OF RACE HORSES

- Horse performing light work for 2-3 hrs/day, their energy requirements increases 50% above maintenance.
- Horse performs moderate work such as fast trotting, cantering, jumping, etc. for 4-5 hrs/day, energy requirement increased by 70% above maintenance.
- It is not possible to meet the energy needs by feeding roughage alone in above conditions.
- Further horses after several hours of work do not eat enough, hence, the energy density of the ration has to be increased by supplementing grains.
- Addition of fat to the ration upto 10% also increases the energy density.

Ration for 500 kg horses performing light work

1. Alfa alfa / grass hay – 7 Kg
2. Crushed oats / barley – 2 Kg
3. Mineral mixture – 30 g
4. Iodised salt – free choice

Ration for 500 kg horses performing moderate work

1. Alfa alfa / grass hay – 8 Kg
2. Crushed oats / barley – 3 Kg
3. Mineral mixture – 30 g
4. Iodised salt – free choice

Ration for 500 kg horses performing intense work

1. Alfa alfa / grass hay – 9 Kg
2. Crushed oats / barley – 4.5 Kg
3. Oil – 500 g
4. Mineral mixture – 30 g
5. Iodised salt – free choice

Feeding of horses before riding

- **High intensity work**
  - Remove hay four hours prior to competition.
  - Feed grain four hours before competition.
- **Light to moderate intensity work**
  - Remove hay four hours before riding.
  - Adapt horse to eating smaller quantity of ration spread throughout the day.
  - Feed grain four or more hours before riding.
- **Long distance races**
  - Allow free access to hay right up to the competition.
  - Allow access to hay even during the ride.
  - Feed large quantity of grains/CM four hours before the ride.
  - Feed smaller quantity of grain throughout the ride.

GUIDELINES FOR FORMULATION OF RATIONS IN EQUINES

Feed intake and forage concentrate ratio for different categories of horses

Factor		Feed Intake	
		% of body weight	Forage:concentrate ratio
Maintenance		1.5	100:0
Pregnancy		1.2	75:25
Lactation		2.2	55:45
Work	Mild	1.5	65:35
	Hard	1.5	30:70
3-month foal		3 - 4	0:100
6-month foal		2 - 2.5	25:75
12-month yearling		2	35:65

Discussions……..

Questions, if any……??

THANKS