Feeding of Cattle and Buffalo

DEPT OF ANIMAL NUTRITION
COVSc & AH, Jabalpur

Thumb rule Method

- Conventional method of scientific feeding is difficult for farmers to understand

- Thumb rule is based on practical experience rather then scientific basis

1. Maintenance Ration

Feed stuff	For Zebu Cattle	For Crossbred cows and buffaloes
a. Straw	4 kg	4-6 kg
b. Concentrate mixture 14-16% DCP 68-72% TDN	1-1.25 kg	2.0 kg

2. Extra Allowance during Pregnancy

During last trimester of pregnancy- 1.25 kg for Zebu and 1.75 kg concentrate for CB and Buffaloes

3. Extra Allowance for Milk Production

40% extra concentrate for per kg milk in case of cattle and 50% in case of buffaloes

FEEDING OF CALVES FROM 0-3 MONTHS

- Nutrient requirement of growing calves :
  - Pre-ruminant growth period
  - Post-ruminant growth period

Preruminant growth (from birth to 3 month)

- Extra nutrient should be provided during last 2 months of gestation
- Expected dam should be provided with 15-20 kg green fodder
- First feed i.e. coloustrum shd be fed to the calves within 2 hrs
- It shd be provided for 3 days

Importance of colostrum feeding

- Protein content of colostrum is 17% vs 3.5% in milk. In this main part constitutes of immunoglobulin (IgM, IgG, IgA)
- High content of vitamins (A, D & E) and minerals (Ca, Mg, Fe & P) help the calf to resist infection.
- Luxative action of colostrum

If colostrum is not available we can prepare it (one meal)

S. No.	Ingredients	Qty
1.	Warm Water	275 ml
2.	Raw Egg (55 g)	1
3.	Castor oil	3 ml
4.	Vitamin A	10,000 I.U.
5.	Warm whole milk	525 ml
6.	Aureomycin	80 mg
Given 3 times a day, Whole milk: from fourth day to 3 M of age		

Feeding Schedule of calves upto 3 months of age

Age of Calf	Whole milk	Calf starter	Good quality hay
1-3 days	Colostrum @1/10th BW in 3 feeds	-	-
4-7 days	Whole milk @ 1/10th BW in 3 feeds	-	-
8-14 days	Whole milk @ 1/10th BW	-	-
15-21 days	Whole milk @ 1/10th BW	A little	A little
22-35 days	Whole milk @ 1/15th BW	100 g	*Ad lib.*
Upto 2 months	Whole milk @ 1/20th BW	250 g	*Ad Lib.*
2-3 months	Milk is gradually reduced	500 g	*Ad lib.*

This schedule shd be followed to attain ADGR of 0.5 kg in CB calves

Milk replacer can be given directly after colostrum feeding or after 1 week of age

- Early introduction of solid feed helps in the rapid development of rumen
- Drenching of rumen fluid from adult animals also help to achieve this

Milk Replacer

- It is usually fed in gruel form
- It is used to save whole milk for human consumption
- Example

Dried Skim milk-	50%
Dried whey-	30%
Dextrose-	8%
Oat flour-	5%
Brewers Yeast-	5% (one cell fungus rich in chromium)
Irradiated Yeast-	0.26% (Vit D content is ↑ due to UV)
Trace minerals-	0.04%
Vit A-	1.7%

Calf Starter

- It is a solid feed consisting of ground grains, oil cakes, animal protein supplements and brans fortified with vitamins, minerals and antibiotic feed supplements.
- CP- 23-26% and TDN- 75%
- In early age of calf quality of protein shd be of high BV
- Milk replacer and calf starter shd contain some animal protein sources.
- Growth rate of calves upto 3 months of age is similar in bulls and heifer and thereafter heifer calves grow at a slower rate.

FEEDING SCHEDULE OF CALVES FROM 3 MONTHS TO 1 YEAR

- **4th Month:** 2 kg green fodder + 0.75 kg concentrate
- **5th Month:** 5 kg green fodder + 1.0 kg concentrate
- **6th Month:** 8 kg green fodder + 1.5 kg concentrate
- Quantity of concentrate can be adjusted as per the quality and quantity of green fodder
- **6th -24th month :**
- Individual feeding shd be stopped, males and female shd be kept in separate paddock
- ADG 0.45 kg therefore, 2 kg concentrate (16% DCP and 70% TDN) + 15-20 kg green fodder
- If straw is our main roughage the quantity of concentrate shd be 2.5 kg for 6-12 month calves while 3 kg for calves over 12 months

Feeding of Bull calves

BW (kg)	Gain(kg)	DCP (g)	TDN (kg)	Ca(g)	P(g)
100	0	90	1.0	5	5
	0.5	254	1.6	15	9

- Animals which are earmarked as future sires shd be be kept on liberal milk from 0-3 month
- Milk is supplemented with calf starter and good quality hay from 2nd week
- At 6 month 2.5 kg concentrate and at 1 year 3.0 kg concentrate shd be given
- Care shd be taken that bull calves are not become unduly fat and lethargic
- Young males used for drought purpose shd be castrated at the age 12-15 months
- These animals shd be fed with green fodder to economise their feeding

Feeding of breeding bulls

BW (kg)	DCP (g)	TDN (kg)	Ca (g)	P(g)
400	380	3.6	18	13
500	450	4.5	20	15
600	530	5.4	22	17

- Breeding Bulls shd be fed with good quality fodder (green and dry) together with concentrate to keep them in thrifty condition
- Example: 150 kg bull, DMI 4 kg, ADG 0.5 kg

	RM (kg)	DM (kg)	DCP (g)	TDN (kg)
Requirements		**4.0**	**350**	**2.6**
Hybrid Napier (25,1, 12)	10.0	2.5	100	1.2
Concentrate (90, 12.5, 70)	2.0	1.8	250	1.4
Total	12.0	4.3	350	2.6

Feeding of Working Bullocks

- Increased muscular work results in an oxidation of large amount of nutrients in the body.
- During contraction of muscles immediate energy will met by breakdown of creatinine phosphate and Adenosine triose phosphate
- These high energy phosphates are resynthesized from oxidation of glycogen
- Nutrient requirement of the working animals depends upon labour performed therefore
  - Requirement are categorized into
  - Normal work (6 hrs of carting or 4 hrs of ploughing)
  - Heavy work (8 hrs of carting or 6 hrs of ploughing)

- Eg. Compute a ration for a working bullock weighing 400 kg and doing 6 hrs of ploughing each day available feeds are rice straw, guinea grass and wheat bran.

  DM requirement is 10 kg

Feedstuff	RM (kg)	DM (kg)	DCP (kg)	TDN (kg)
Requirements		10.0	0.57	4.8
Rice Straw (90, 0, 44)	4.8	4.4	0	2.1
Guinea grass (25, 1.5, 15)	8.8	2.2	0.13	1.3
Wheat bran (90, 10, 68)	3.8	3.4	0.38	2.6
		10.0	0.51	6.0

Exercise

- Formulate a ration for a growing heifer weighing 150 kg the DM requirement is about 4 kg per day. Nutrient requirement of the animal at a daily growth rate of 0.5 kg is 0.35 kg DCP and 2.6 kg TDN and the feed stuff available are Green grass (25,1,12) and concentrate mixture (90, 13, 70)

- Nitrogen requirement of rumen microbes is fulfilled by NPN and RDP
- While amino acid requirement of the host animal is fulfilled by microbial protein and UDP

- Concept of BYPASS protein and Fat

- Metabolizable Protein : total digestible true protein (RDP +UDP) available to the animal for metabolism after digestion and absorption of feed in the animal digestive tract

- Now a days requirements were presented in terms of MP

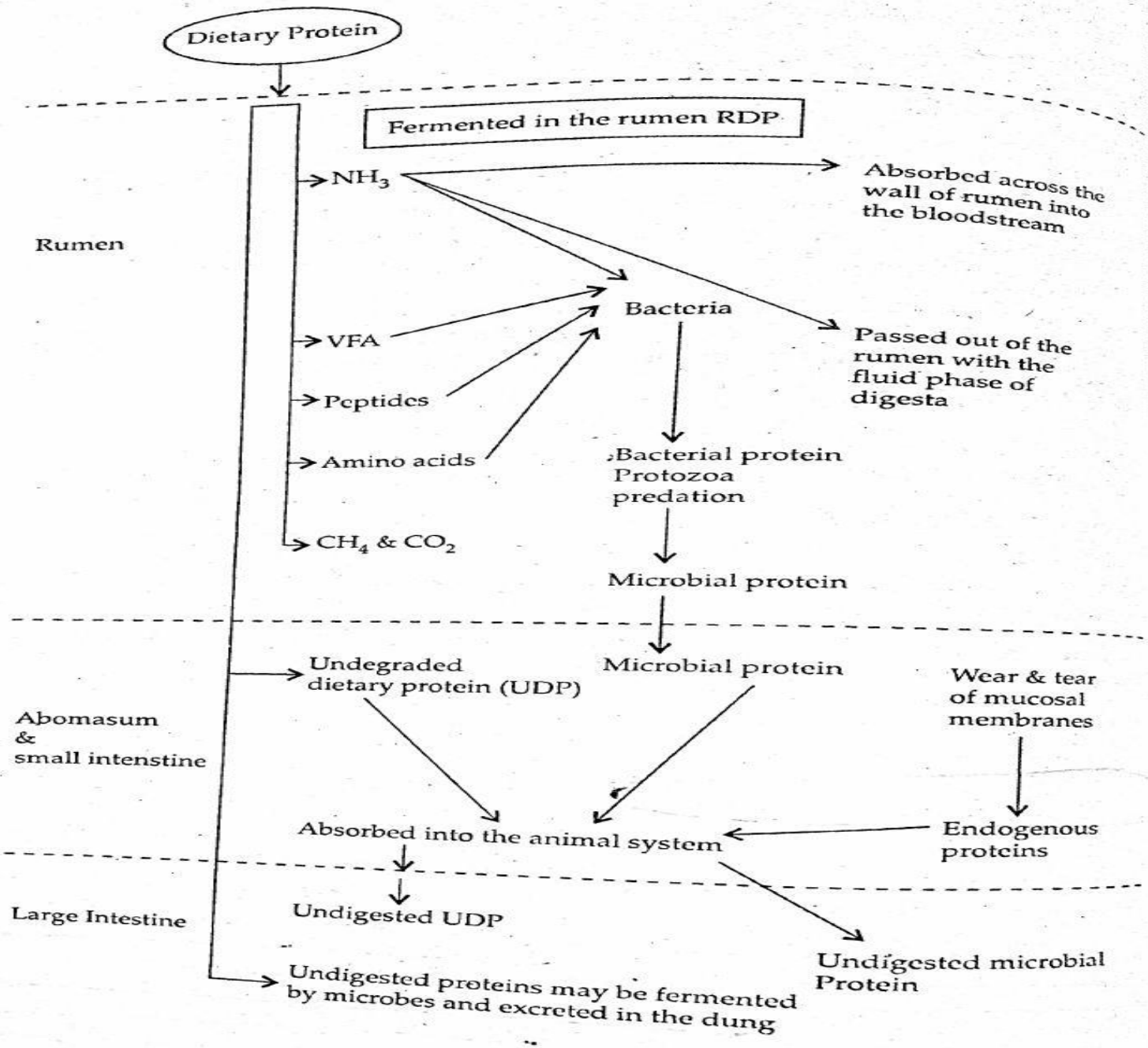

Figure 1. Fate of Dietary Protein in Ruminants.

Feeding of High yielding Cattle and Buffaloes

Maintenance

BW	DCP (g)	TDN (kg)	Ca (g)	P (g)
450	280	3.4	18	14
550	330	4.0	21	16

Maintenance & Pregnancy

BW	DCP (g)	TDN (kg)	Ca (g)	P (g)
450	400	4.4	26	20
550	465	5.2	31	24

Milk Production

Fat %	DCP (g)	TDN (kg)	Ca (g)	P (g)
4.0	45	0.315	2.7	2.0
8.0	69	0.510	3.5	2.8

Feeding of milch animals during early lactation

- CB animals (above 15 lit of milk) lead to high secretion of nutrients into the milk exceeds the rate of uptake of nutrients from the digestive tract.
- Nutrient deficit is compensated by diversion of nutrients from body reserves resulting in weight loss.
- Appetite of the animals during early lactation is reduced by 2-3 kg per day.
- Therefore high energy diet and challenge feeding has to be adopted

Challenge feeding

- High milk producing animals are fed increasing quantity of feed challenging them to produce to their maximum potential
- Challenge feeding starts 2 wks before the expected date of calving
- Feeding of the concentrate mixture shd be started initially at 500 g to 1000g /100kg BW/day

Feeding of soybean to high yielding animals

- Feeding of whole oil seed or solvent extracted meal over and above normal concentrate
- Persistency of milk production