

DAIRY CATTLE NUTRITION – PRACTICAL APPROACH

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INTRODUCTION

- ▶ India possess first place in milk production in world and produced 221.06 MMT milk annually
- ▶ Short fall in agriculture production, dairy cattle helping the lively hood of rural people
- ▶ Most of the farmers, not providing feed properly leads to decrease in milk production and reproduction efficiency of dairy cattle
- ▶ Balanced feeding is very essential for normal functions of dairy cattle. Without feeding, the benefits of good breeding and management programmes cannot be realized.
- ▶ Feeding programme include adequate supply of energy, protein, minerals and vitamins for various physiological conditions
- ▶ Further, feed costs also accounts 60-70 % of the total cost of production.
- ▶ Hence, feeding of dairy cattle with a practical approach is a need of an hour on betterment in dairy cattle production/ reproduction with lees feed cost.

DAIRY CATTLE NUTRITION – PRACTICAL APPROACH

Lessons	Titles
1	Feeding management of calves, growing heifers and bulls
2	Feeding management of dairy cows
3	Feeding management in the prevention of production diseases
4	Methane emission from ruminants and its mitigation strategies
5	Ration balancing in practice



Feeding Management of Calves, Growing Heifers and Bulls

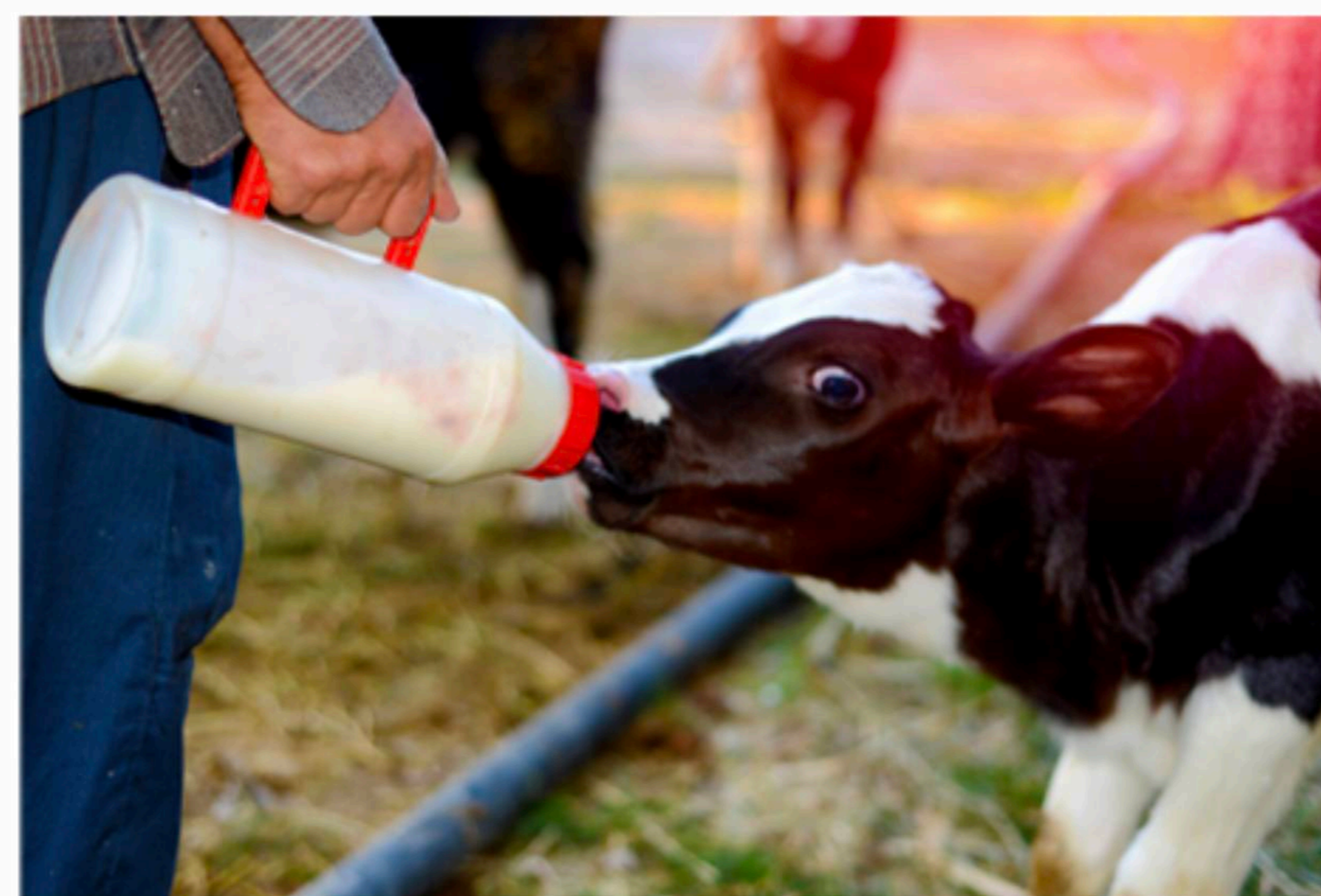


OBJECTIVE

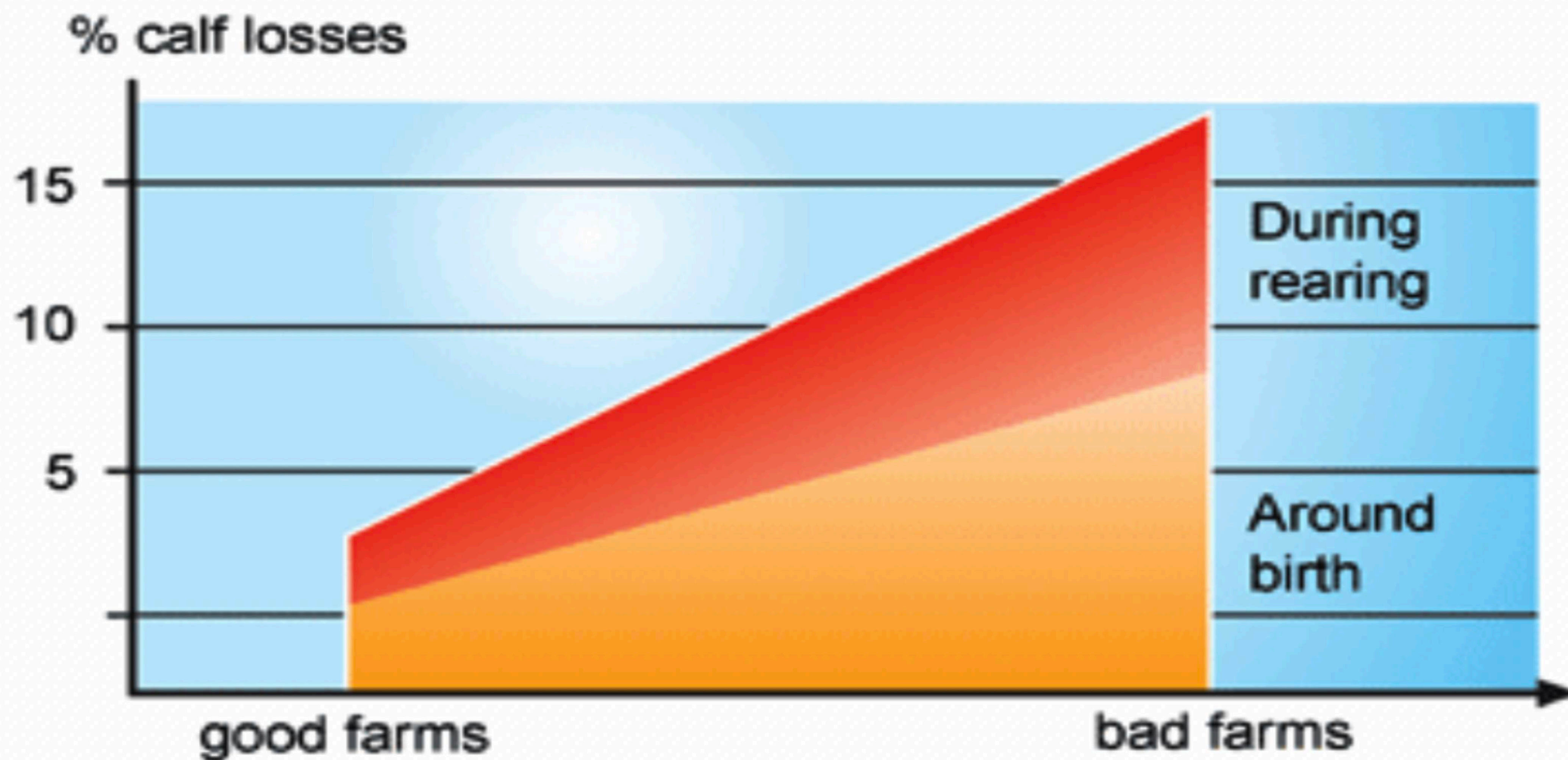
To impart the knowledge on practical approach of feeding management of calves, heifers and bulls

Feeding Management of Calves

- ▶ Calf is the future of the farm
- ▶ Calf feeding is important for optimum rate of growth and weight gain.
- ▶ Higher the plan of nutrition, the earlier is the onset of puberty as fast as 14-16 months
- ▶ Calves stunted from underfeeding or diseases may not develop into healthy and profitable cows
- ▶ Calves mortality can be a serious problem and has to be minimized with less than 5%
- ▶ Calf feeding requires a lot of work and attention



Calf losses reduce potential for increasing numbers and quality of cattle



Factors Affecting Nutrient Requirement of Calves

- ▶ Factors Affecting Nutrient Requirement of Calves
- ▶ Functional rumen, which lowers the efficiency of utilization of casein and lactose from milk
- ▶ Growth and digestibility
- ▶ Quality of protein affects the dietary requirement of protein

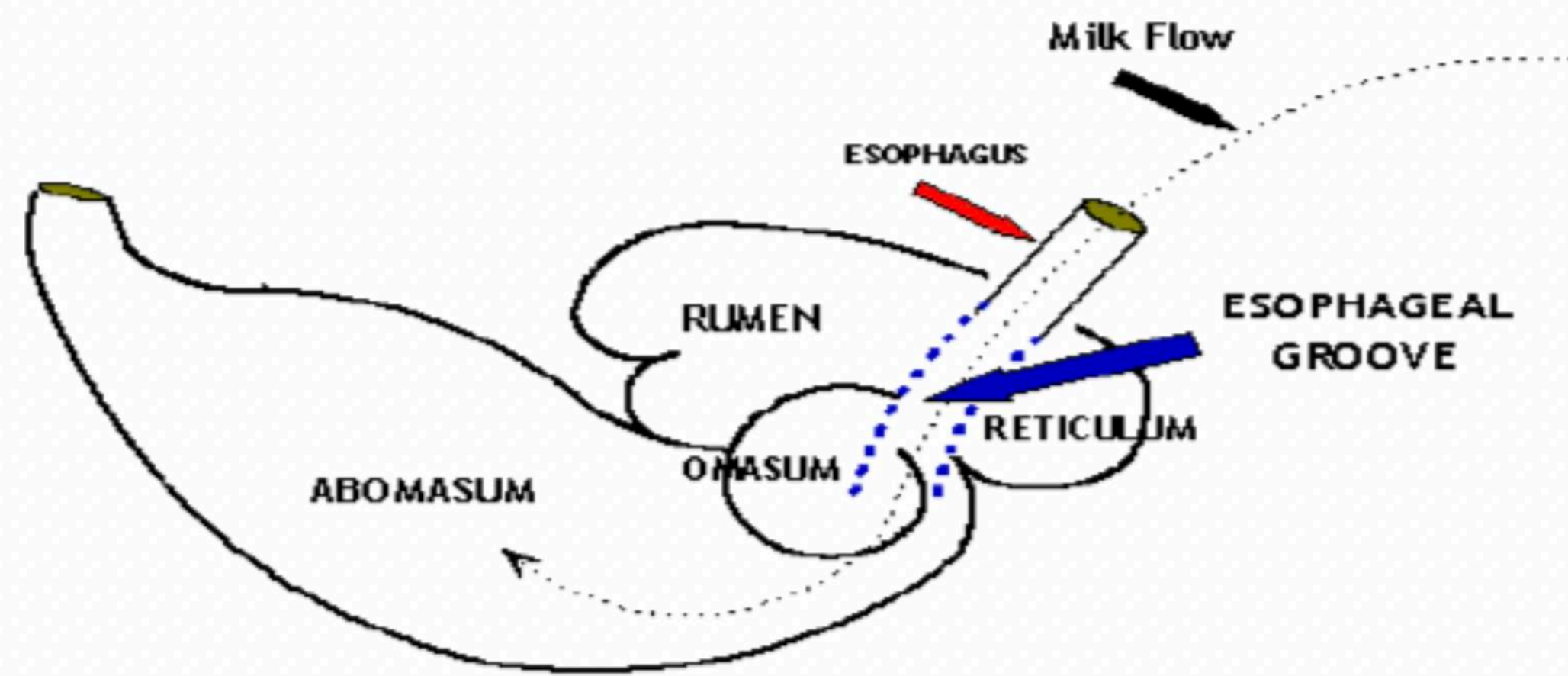
Optimum digestible protein (g) : digestible energy (kcal) ratio: **1:35**
for gain of **500 g / day**

- ▶ Feeding higher dietary crude protein will increase the carcass protein and decrease fat content.
- ▶ Feeding higher dietary energy will increase carcass fat and decrease protein content.

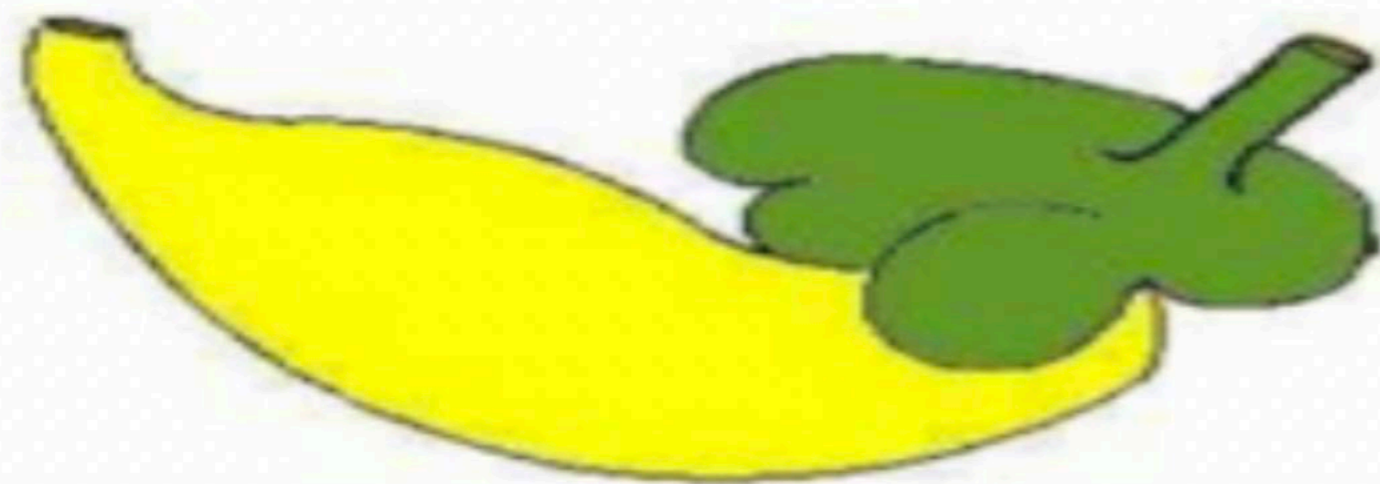




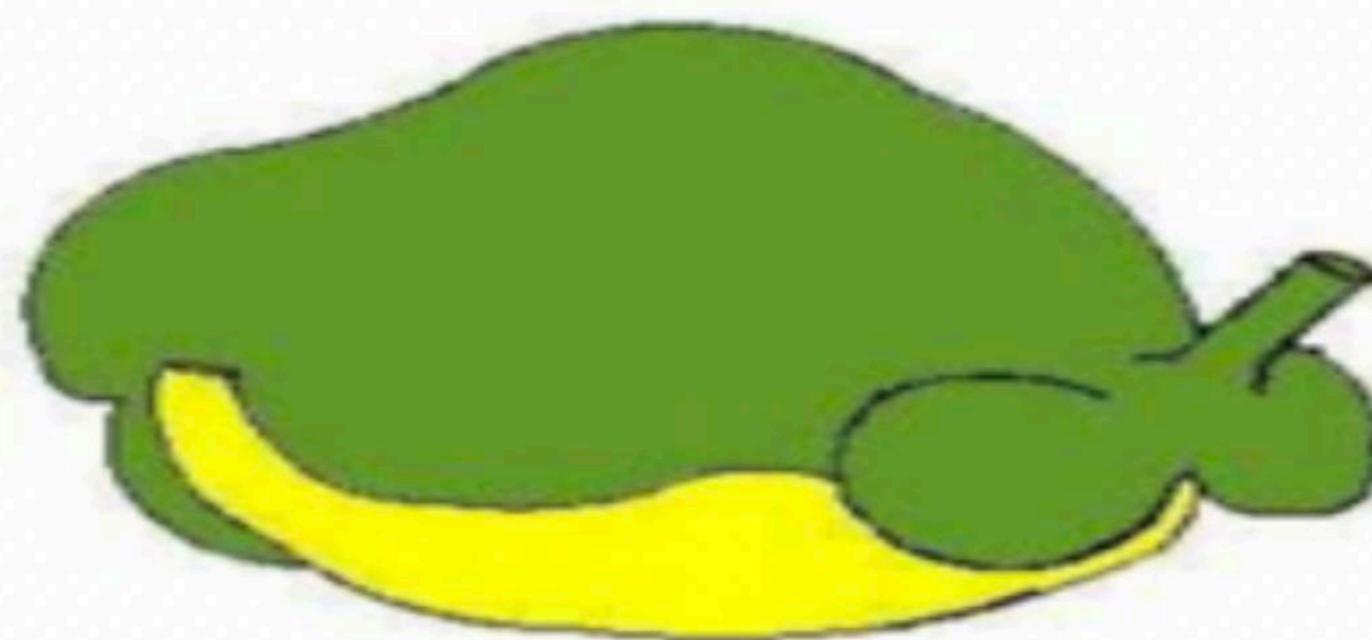
Calf Rumen is Not Developed



▶ **NEWBORN CALF STOMACH**
Abomasum 70%

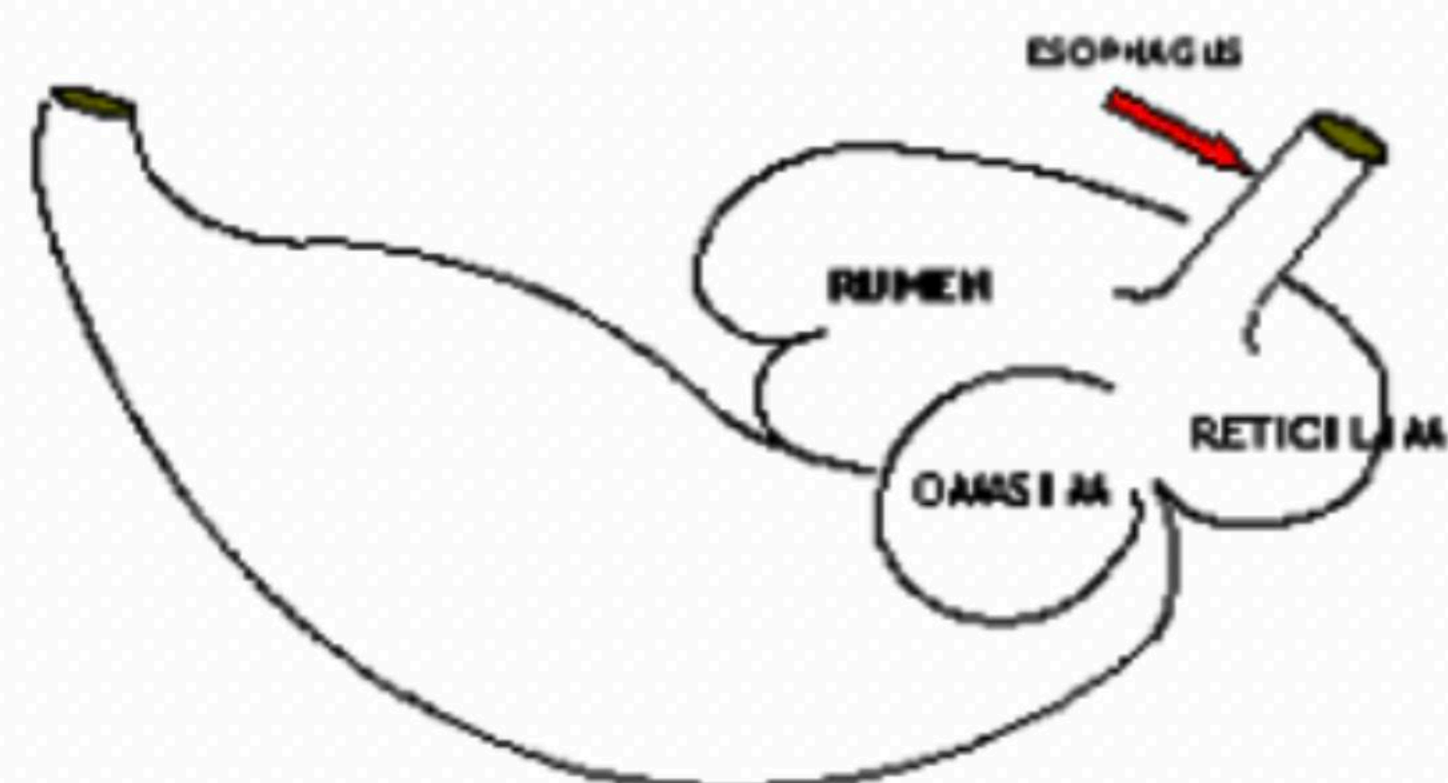


▶ **ADULT CATTLE STOMACH**
Foregut 90%

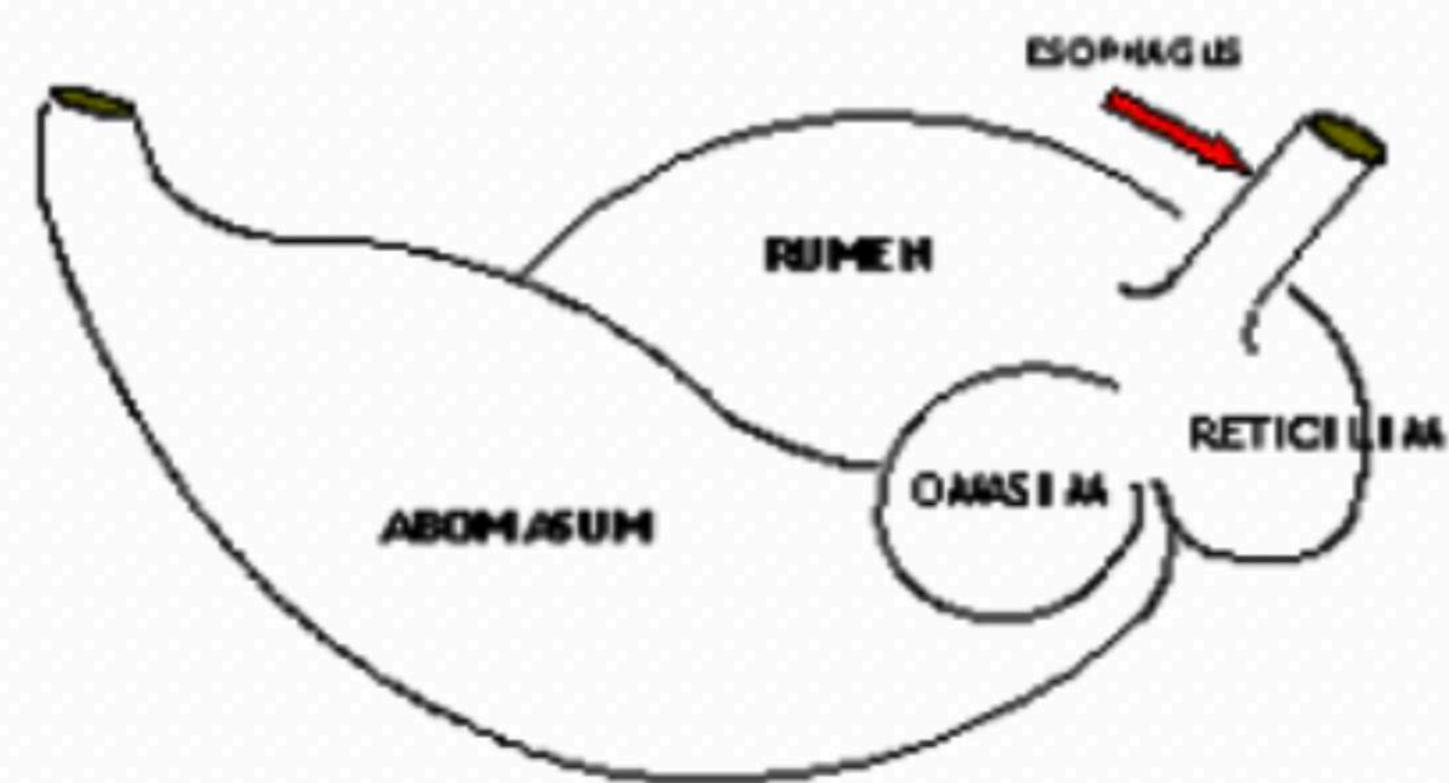




Development of Rumen In Calves



Birth to 2 weeks



8 weeks



3 - 4 months



Mature

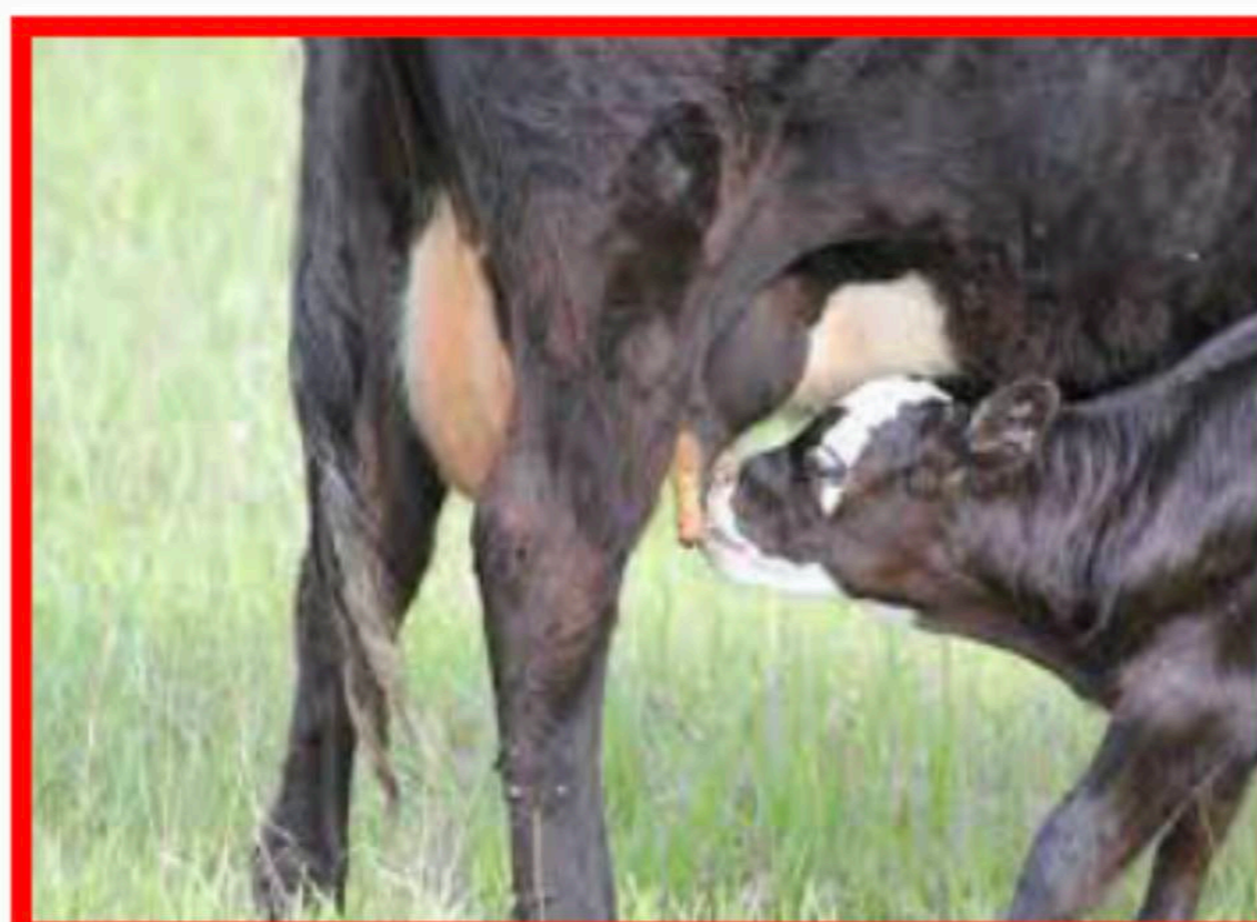
Feeding Colostrum in New Born Calves

- ▶ Immediately after birth calf should be given colostrum within 2 hours and continued for 4-6 days
- ▶ Contains antibodies and immunoglobulins
- ▶ It has a laxative effect in removing muconium.
- ▶ The colostrum should be fed at the rate of 1/10th of body weight of the calves.



Composition of Colostrum and Whole Milk

S.No.	Component (%)	Colostrum	Whole milk
1	Total solid	23.9	12.5
2	Protein	14.0	3.2
3	Fat	6.7	3.2
4	Antibody	6.0	0.09
5	Lactose	2.7	4.9
6	Minerals	1.11	0.74
7	Vitamin A ($\mu\text{g}/\text{dl}$)	295.0	34.0



Artificial Colostrum

S.No.	Component (%)	Colostrum	
1	Warm whole milk	525 ml	
2	Warm water	275 ml	
3	Raw egg	One	
4	Castor oil	3 ml	
5	Vitamin A	10,000 IU	
6	Aureomycin	80 mg	

In addition, it is necessary to inject the calf with dam's serum for augmenting the antibody titre in the body, particularly for buffalo calves

Feeding Schedule for Calves Up to 3 Months of Age

Age of the calf	Whole milk	Calf starter	Good quality fodder
1-3days	Colostrum @ 1/10 th Body weight in three feeds	-	-
4-7 days	Whole milk @ 1/10 th Body weight in three feeds	-	-
8-14 days	Whole milk @ 1/10 th Body weight	-	-
15-21 days	Whole milk @ 1/10 th Body weight	A little	A little
22-35 days	Whole milk @ 1/15 th Body weight	100 g	Adlib
36 - 60 days	Whole milk @ 1/20 th Body weight	250 g	Adlib
60 - 90 days	Milk is gradually reduced and tapered	500 g	Adlib

Calf Starter

- ▶ Calf starter is offered from 15th day of age to when they are raised on limited milk intake.
- ▶ The calf starter should contain 18 - 20 % Digestible crude protein (DCP) (CP: 24-26 %) and 70-75 % TDN.
- ▶ Protein should be supplied through purified protein supplement like skim milk powder for balancing the essential amino acid requirement

SPECIFICATION

S.No.	Nutrients (%)	Requirement
1	MOISTURE (Max.)	10
2	CRUDE FIBRE	7
3	CRUDE PROTEIN	23-26
4	CRUDE FAT	4
5	TOTAL ASH	5
6	ACID INSOLUBLE ASH (Max.)	2.5



Calf Starter

Ingredients	I	II	III	IV	V
Crushed Maize	-	-	-	50	50
Crushed Barley/sorghum	50	50	50	-	-
Groundnutcake/Til cake	20	20	20	20	20
Wheat bran/Rice bran	10	10	10	10	10
Skim milk powder	20	20	20	20	20
Total	100	100	100	100	100

▶ To each 100 kg of above mixture, 5-10 kg of molasses, 10 g vitamin supplement, 500 g salt, 2 kg mineral mixture and 20 g antibiotic mixture should be mixed thoroughly.

Green fodder feeding:

Along with calf starter good quality green fodders should be given ad libitum quantity



Feeding Milk Replacer to Calves

- ▶ Fed to calves as early as at 10 days of age to replace milk
- ▶ Should resemble milk on broad chemical composition
- ▶ should be low in crude fibre and free from any antimetabolites.
- ▶ Should contain propionic acid, citric acid and some antibiotics as additives to stimulate the growth and to build up vitality and resistance against diseases.
- ▶ The replacement of milk by milk replacer should be gradual to facilitate its acceptance and to avoid a drop in growth rate.

