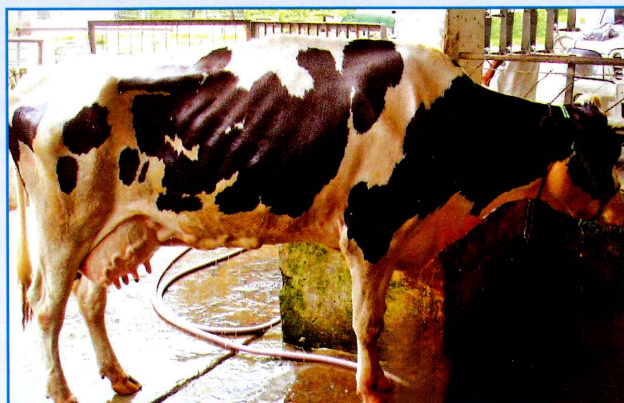


Bypass Fat Supplement

Rumen protected fat in the form of calcium salts of long chain fatty acids



A rich source of fat for improving milk production and reproduction efficiency

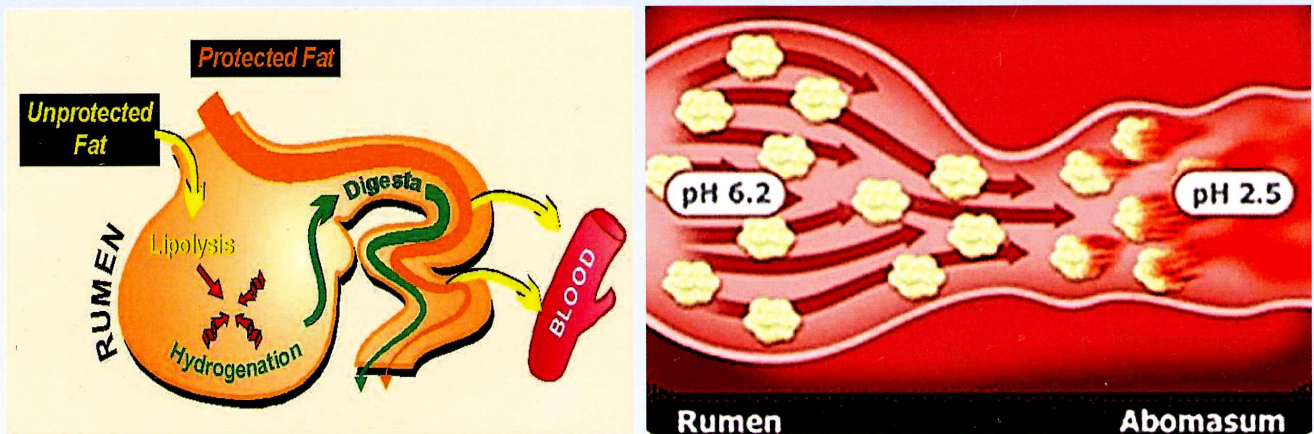


**National Dairy Development Board
Anand**

Introduction

Usually, ration of crossbred cows and high yielding buffaloes during early lactation is energy deficient. The animals are fed limited quantity of cultivated fodder and energy rich supplements. As a result, animals loose body weight after calving at a faster rate. Under field conditions, crossbred cows and buffaloes often loose around 80-100 kg body weight after calving. Such debilitated animals don't come in heat, unless they fully or partially recover from the lost body weight. This leads to delayed conception in animals after calving, resulting into longer inter-calving interval. In addition, the animals produce less milk during this period, thus, decreased lactation yield. Overall, it is a significant economic loss to milk producers on account of less milk production and longer inter-calving interval.

Raw edible oils if given beyond certain proportion as a source of fat for increasing energy density of the ration may adversely affect fibre digestion and bind divalent mineral ions. Therefore, it is necessary to supplement the fats in such a form, which can provide energy without affecting fibre digestion in the rumen. This should be possible if fat is supplemented in rumen protected form, which does not interfere with the fibre digestion in the rumen.



Bypass fat thus get digested in the abomasum at acidic pH, without interfering with the fermentative digestion in the rumen. Fat supplements in this form are termed as bypass fat, which can help in improving milk production, body condition score and reproduction efficiency.



Bypass fat manufacturing plant


Bypass fat plant comprises two storage tanks for storing palm fatty acid distillate (PFAD), two feeding pumps for unloading PFAD in storage tank and its transfer to over head storage tank, over head storage tank with a load cell, a reaction vessel, high speed blender and a discharge device, water tank and other miscellaneous equipment and materials.



Characteristics of bypass fat

Bypass fat comprises fatty acids associated with calcium ions, instead of a glycerol backbone. When calcium is associated with fatty acids, the fat supplement thus formed is rumen inert. Bypass fat has low solubility in the rumen and is less susceptible to biohydrogenation. However, in abomasum at acidic pH it dissociates and set free fatty acids and calcium for absorption. Feeding bypass fat to early lactating animals increases milk and fat yield and ensures early conception.

Specifications of bypass fat supplement

Characteristics	Requirement	
Moisture (%)	4-5	
Fat content (%)	80-84	
Calcium content (%)	7-9	
Colour	Light brown to pale yellow	
Physical appearance	Free flowing granules	
Protection (%)	78-82	

Fatty acid composition of PFAD based bypass fat

Name of the fatty acid	Content (%)
Palmitic acid (C _{16:0})	46-49
Oleic acid (C _{18:1})	36-38
Linoleic acid (C _{18:2})	7-8
Stearic acid (C _{18:0})	4-6
Myristic acid (C _{14:0})	1.1-1.4
Lauric acid (C _{12:0})	0.2-0.3



Recommended daily feeding rate

Crossbred cows: 100-150 g

Buffaloes: 150-200 g

Bypass fat can also be incorporated in the feed of growing calves and lactating animals @ 1.5-2%, for increasing energy density of the feed.

Benefits of feeding bypass fat

- Ideal energy dense supplement for early lactating and advanced pregnant animals to overcome negative energy balance.
- Enhances peak milk production and persistency of lactation.
- Fulfils the nutrient requirements of high yielding animals.
- Reproductive performance can be enhanced because the animal can return to positive energy balance sooner which can affect follicle size, ovum fertility and progesterone levels.
- Decreases metabolic disorders such as ketosis, acidosis & milk fever.
- Increases productivity and productive life of animals.

For more information, please contact: Dr. M R Garg; mrgarg@nddb.coop