Dairy Farm Management

Selection of animals for foundation stock

- Cows- Crossbred/Pure
- Buffalo- Pure
- Availability- From Organized farms/farmers' herd
- Cow: Buffalo= 40:60
- Age & Pedigree
- Health status
- Vaccinate the newly purchased animal against disease.

Selection of animals for foundation stock

- Keep the newly purchased animal under observation for a period of about two weeks and then mix with the general herd.

Components in a commercial Dairy Farm

- Milch animal sheds
- Calf shed
- Feed Godown
- Chaffing area
- Milk Collection Unit
- Dispensary room
- Paddock
- Drainage system
- Foot bath
- Store

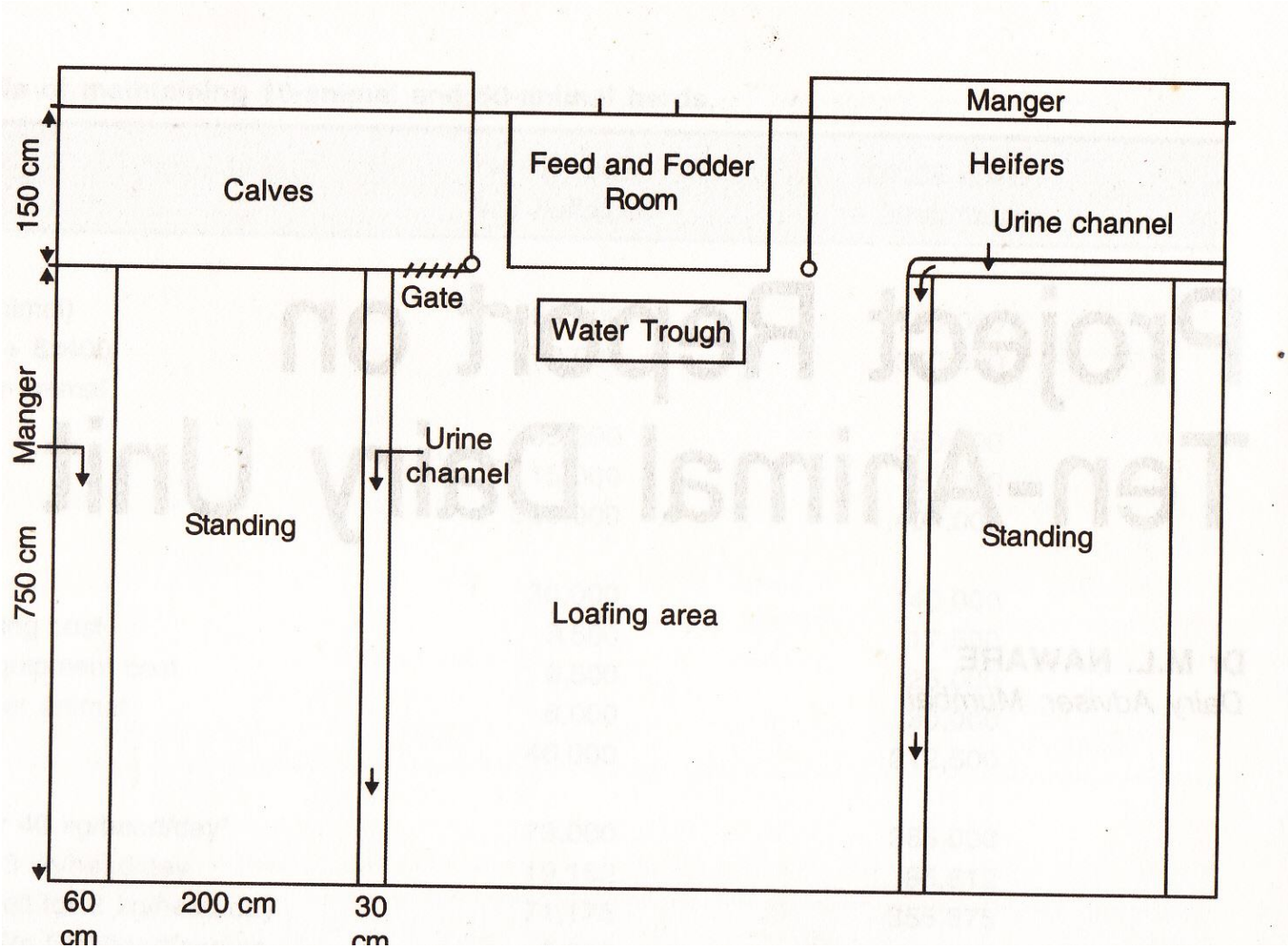
Space requirement for animals

Animals	Covered area (sq ft)	Open area (sq ft)	Feeding manger-length (ft.)	Water trough -radius (ft.)
Adult cows	80	160	3	6
Heifer	55	115	2	4
Young Calves (< 6 months)	10	40	1.2	2

Dairy Farm with Paddock

Face to face System

Sketch of a typical dairy shed of 10 cows



Tail to Tail System

Critical requirements for housing

- Provide **adequate space** for animals
- Provide proper **ventilation**
- Ensure good **slope** in the floor & drainage
- Floor should be hard, non-slippery
- Foot-bath with disinfectants to be placed at gate.

Dairy Barn for Tropical Climate

List of equipment used in a dairy farm of 50 cows

Equipments	No.	Material
Tying chains	50	Iron
Milking pails (10 lt.)	10	Steel
Milk Can (40 lt)	7	Alluminium
Milking machine	2	Steel
Weighing balance	1	-
Sickles	10	Iron
Brush	5	-
AI equipment	One set	-
Veterinary equipment	-	-
Dehorner	1	-
Branding/Tagging machine	1	-

Routine Operations in a Dairy Farm

- Washing & grooming the animals
- Cleanliness of milking barns
- Disinfections
- Feeding the animals at regular intervals
- Milking at regular intervals
- Record Keeping

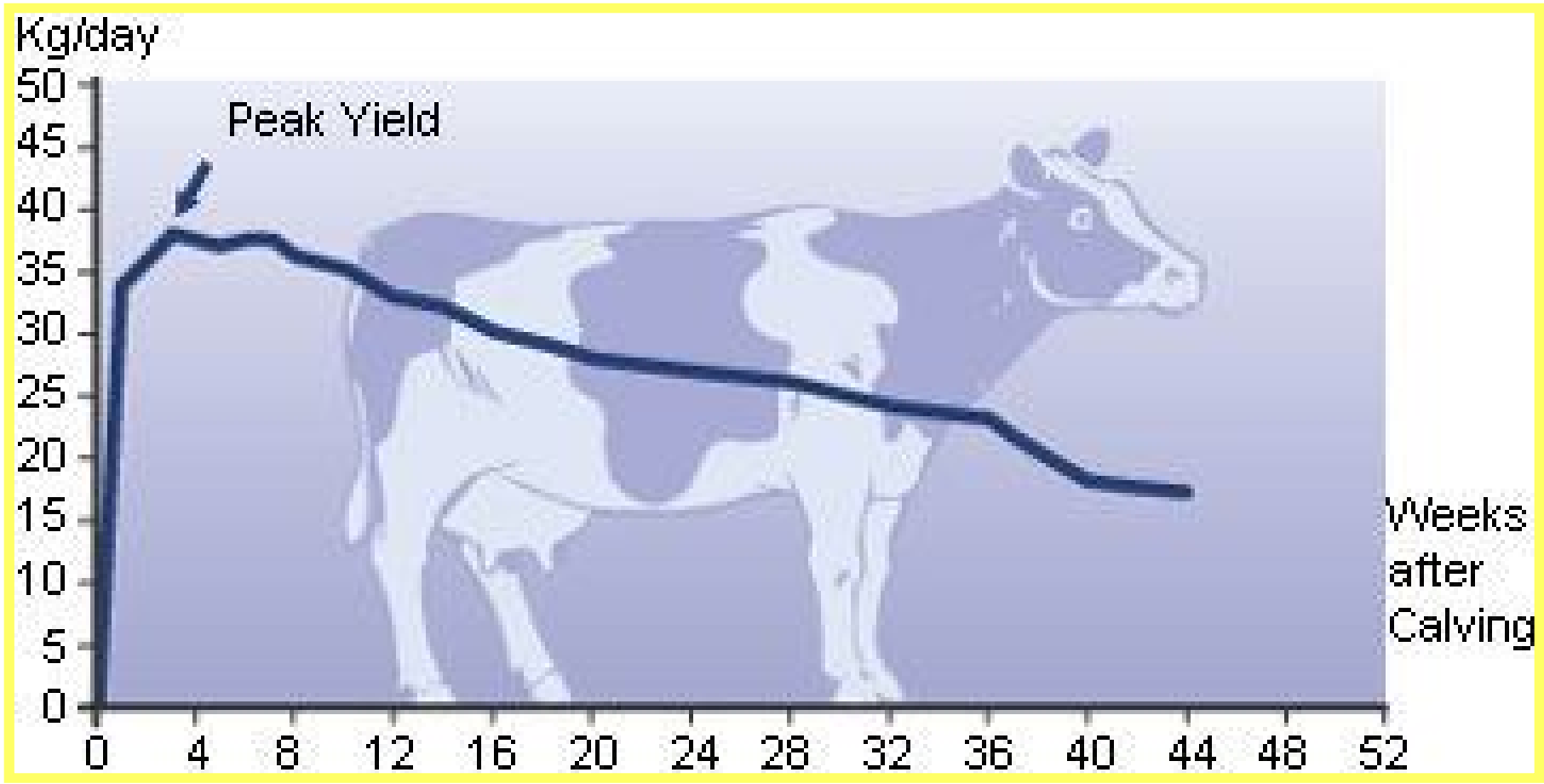
Special Management Care for Animals

- Care for lactating animals
- Care for New born calves
- Care for pregnant animals
- Care for dry cows

Management During Lactation

- After calving, the cow produces special milk called colostrum.
- This milk contains various types of antibodies.
- The cow will continue to lactate until she becomes pregnant again but the farmer will aim for a period of 10 months. (305days)
- The LACTATION CURVE shows the typical trend during the cows lactating period.
- The cow must be fed enough nutrients so that she reach's her full milking potential in the period up to and including the *lactation peak*.

The Lactation Curve



Care of calves

- Treat/disinfect the navel cord with tincutre of iodine as soon as it is cut with a sharp knife.
- Feed colostrum to calf.
- Assist the calf to suckle if it is too weak to suckle on its own within 30 minutes of calving.
- Keep the calf separately from birth till two months of age in a dry clean and well ventilated place.
- Protect the calves against extreme weather conditions, particularly during the first two month
- Group the calves according to their size.
- Vaccinate calves.
- Dehorn the calves around 4 to 5 days of age for easy management when they grow.
- Dispose of extra calves not to be reared/maintained for any specific purpose as early as possible, particularly the male calves.

Reproduction Management

For high level of reproductive efficiency…

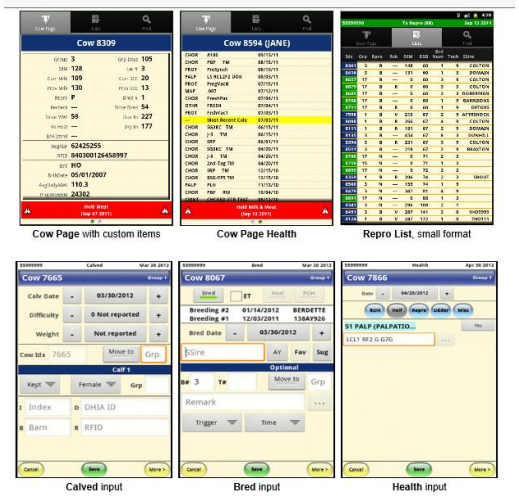
- A cow must attain puberty by 2-3 years.
- Produce first calf earliest by 3 – 4 years.
- A normal dairy cow should deliver a healthy calf every 12 -15 months.
- A cow should come to *estrous*/heat in every 21 days cycle regularly.

Steps for maintaining good reproductive management

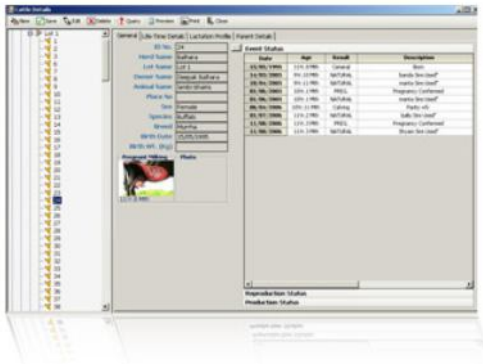
1. Heat detection
2. Insemination
3. Pregnancy Diagnosis
4. Care of pregnant cow
5. Post-partum reproductive health care
6. Management of repeat breeding cows
7. Record keeping of breeding cycles

Different softwares used for dairy herd managements

Merk Animal Health



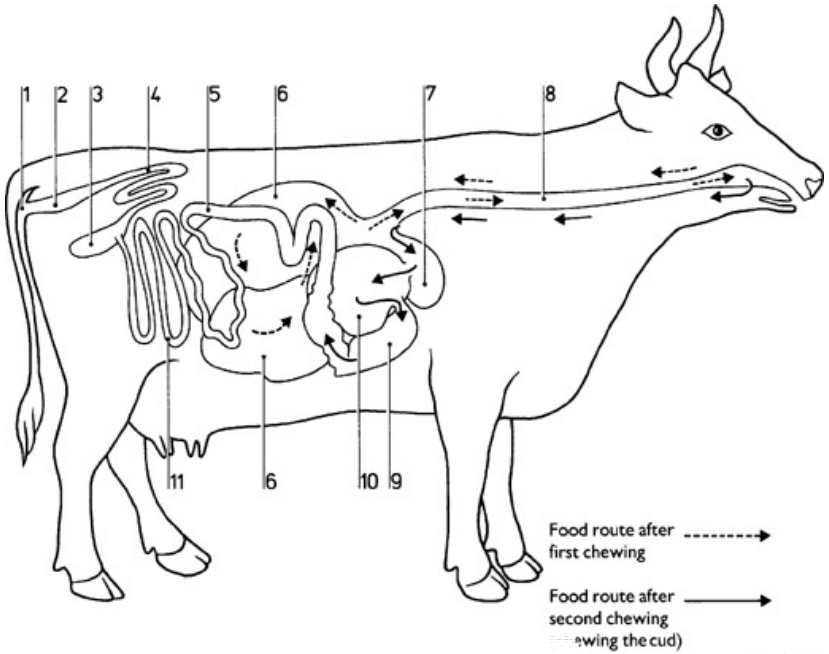
Pocket Dairy



Herdman

Feeding Management

Cows are ruminants…



Ruminants are characterized by having a stomach with four compartments

Nutrient requirement of a dairy cow

- Energy requirement: 1800-31980 Kcal/day
- TDN expresses the relative energy value of feeds
- Balanced ration of dairy cows should contain DCP: 14-16% & TDN: 68-72%
- Feed contains- Roughages+ Concentrates
- Requirement of Dry Matter- 2.5 Kg/100 Kg body wt.
- DM as roughage= 2/3rd
- DM as concentrate= 1/3rd

Composition of a concentrate mix.

Ingredient	%	DCP in ingredients	DCP in ration	TDN in ingredients	TDN in ration
Wheat/Maize (Cereals)	33	7%	2.31	80%	26.40
Groundnut cake/mustard cake/Till cake/Mug Chuni (Oil Cakes)	33	38%	12.54	73%	24.09
Rice bran (Cereal by products)	33	10%	3.33	66%	21.78
Salt/Min. Mix/Vitamin	1	-	-	-	-
GIVEN			18.18		72.27
RECOMMENDED (Minimum)			14.00		68.00


অরহর 15%
তিল খৈল 10%
মুগচুনী 10%

Ration of a dairy cow: Thumb-rule

- *Roughage- 3-4% of B.wt.*
  (5-6kg straw+ 4-6kg greens)
- *Maintenance Ration*-Feed required to maintain the essential body processes at their optimum rate.
- M. Ration- 2 kg conc. per day
- Additional ration = 500 gm. Conc. /liter of milk production
- Total Concentrate reqd./day for a cow that gives daily 10 liter of milk=?

Advantages of Fodder Cultivation

- Green fodder contains all necessary nutritive components-*Protein, Carbohydrate, Vitamins, Minerals & others*
- Contains “Carotene” which is not generally available in concentrates.
- Improve the quality of milk of livestock & eggs of Poultry birds
- Improve immunity
- Reduce the production cost of animal produce

Perennial grasses

Hybrid Napier

Teocenti

Para grass

Congo grass

Seasonal grasses

Barseem

Cow-pea

Maize+Rice-bean inter cropping

Azolla- a good unconventional fodder

- 20% high quality protein
- 10% minerals
- 1.5 kg azolla increases milk production 15%
- Production cost is min.

Schedule for growing green fodders

July-Oct	Nov.-Apr	May-June
Napier	Napier	Napier
Maize	Barseem	Maize
Cowpea	Oat	Cowpea
Jowar		

Fodder Scenario In West Bengal

- Requirement of (Green & Dry) Fodder
  Green-439.15 MT, Dry-175.67 MT
- Availability- 247.58 Lakh Metric Ton
  Green-109.25 MT, Dry-138.38 MT

Shortage- Green Fodder- 329.90, Dry-37.35 MT

- Fodder Land-1.18% while National Average-4%.
- Availability of Pasture and Grazing Land-0.77% of total Land
- Major Feed ingredients (e.g Maize, Soybean) are brought from other States

Constraints in Relation to Feed & Fodder Development in W.B.

- Proportionate Insufficiency of Cultivable Land with Human Population
- Non-availability of Fodder land
- Lack of Interest towards Production of feed grains and fodder
- Primitive Animal Husbandry Practices
- Habit for Production of Cash Crops
- Lack of Awareness and Knowledge for producing feed grains and Fodder
- Lack of knowledge for preservation and value addition to fodder
- Non-availibilty of quality Fodder Seeds

Solution!

- Encourage the farmers to shift from cash Crops to Feed grains and Fodder by providing-
  - Minimum Supportive Price for few years as Well as developing Market Linkage
  - Vigorous training
  -Mass Awareness Programme
  -Establishment Fodder Sale Counter in every Block

Solution!

-Promotion of Fodder cultivation in the unconventional area like watershed, cultivable waste land, in the interspaces of forest land and orchard (e.g. Centrosema, Calopo, Siratroo, Stylo)

- Crop Schedule /Intensive forage crop rotations

  -Cultivation of short duration fodder crops b/w two agricultural crops

  - Utilization of mono-croped land for cultivation of fodder

  -Cultivation of fodder crops in the land not suiatble for agricultural crops (e.g., Coix, Paragrass in marshy land)

Urea treatment of straw

- Urea is a major source of NPN in cattle feed.
- Straw treated as bellow:

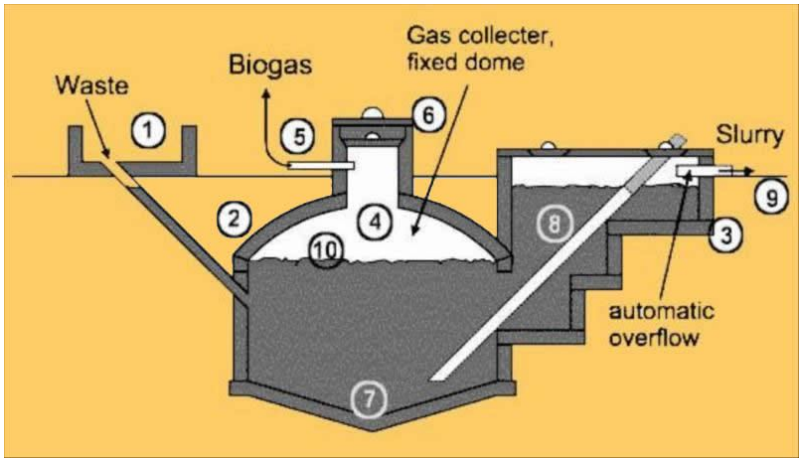
  100 Kg straw+(40 Kg water+4 Kg Urea)

  Then, Urea solution sprayed over the layers of straw.
- The entire stock is covered by polythene sheet for 3-4 wks.
- The treated straws contain more N_2 content.
- Sometimes, mineral is added to improve nutritive value.


Manure management

Bio-gas plant

- It is an aneorabic digester that produces combustible gas from cow dung.
- Cow-dung slurry is added daily to the digestion tank and then spent slurry overflows from the top of the well and collects in a pit wherefrom it is periodically removed and added to the manure pit.
- The gas consists of about 50-60% methane, 30-40% CO_2 and 10% H_2.
- IARI first developed biogas plant in 1941 in India.



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Volume of BG plant (Cu. Mt.)	Cow dung reqd. (kg)	No. of animals
2	30-45	3-4
4	55-60	5-7
6	80-100	7-10

Milk & Milk Products

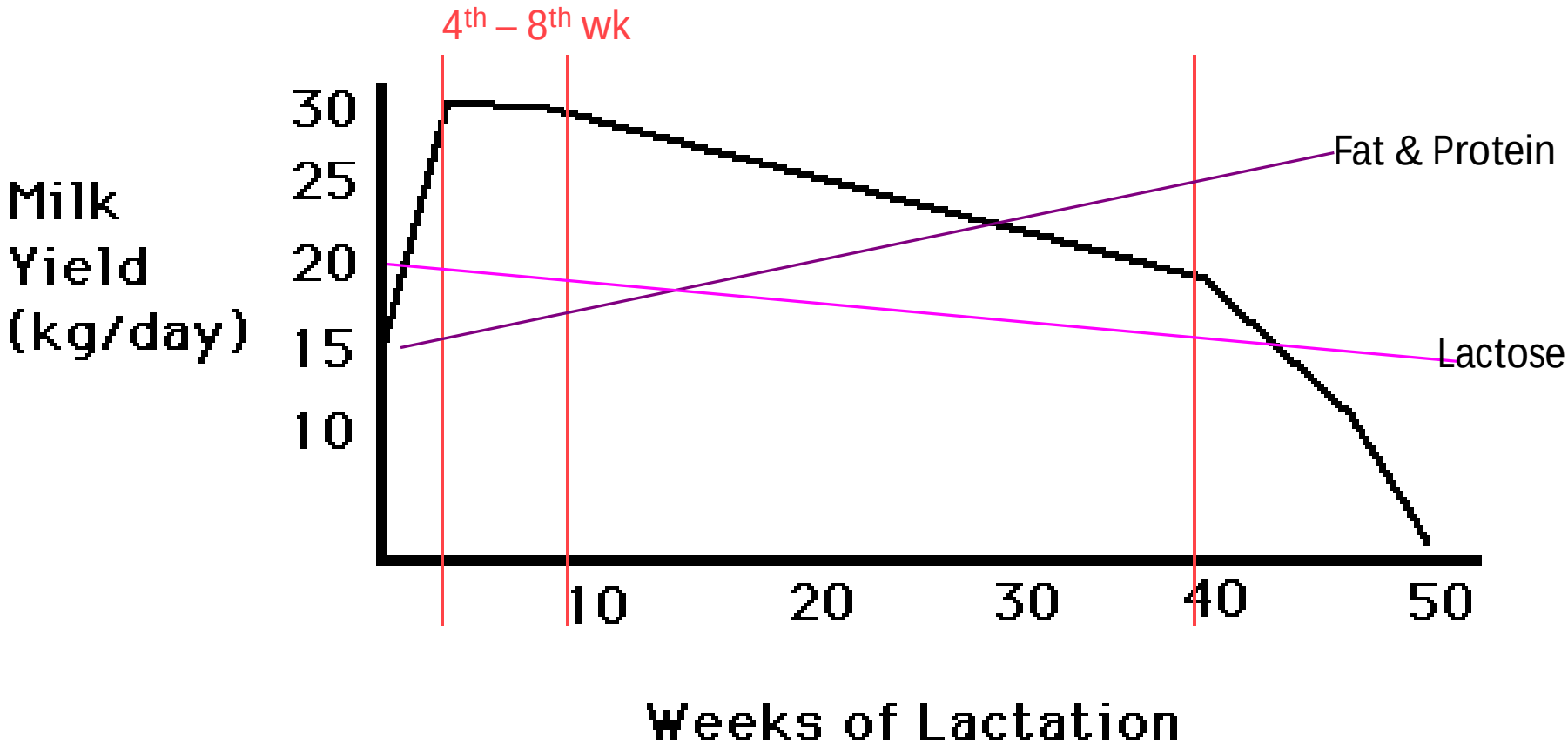
Milk

- Milk is the normal mammary secretion derived from the complete milking of healthy milch animal.
- Milk is valued commercially for its two important parameters – i) milk fat and ii) SNF (Solid Non Fat).
- White color of milk is due to emulsified fat globules in the milk.

Milk composition

	Water	Fat	Protein	Lactose	Ash
Sahiwal	86.42	4.55	3.33	5.04	0.66
Gir	86.44	4.73	3.32	4.85	0.66
Holstein	87.92	3.40	3.13	4.86	0.69
Jersey	85	5.5	3.9	4.9	0.70
Buffalo	82.76	7.38	3.60	5.48	0.78
Colostrum (Cow)	77.5	3.6	14.3	3.1	1.5

Lactation yield



Basic operations in Dairy plants

- Farmers-----→ Raw milk collection
- Stored in Chilling plants.
- Transported and received at Dairy Plants by ‘Bulk coolers’.
- **Bulk milk cooler**: 500 – 2500 lt of milk/day. These are horizontal/vertical cylindrical tanks with insulation. A cooling coil from refrigeration system chills the milk. Milk is cooled to 4 ºC. The agitator inside tanks helps uniform cooling.

Then Milk is pumped into large vertical storage tanks, called ‘Silo’.

Milk clarification

- It is the process of removal of solid particles of higher density by centrifugal force.
- Solid impurities are collected through an outlet.

Milk Separation

- Fat content of the dairy products need to be adjusted to meet the legal standards.

- Fat is separated from raw milk by ‘cream separator machine’.

Standardization

- This refers to the adjustment, i.e raising or lowering the fat or solid-non-fat percentage of milk to a pre-determined value.

- Different proportion of fat or skimmed milk or SNF is mixed to obtain required standard.

Homogenization

1. Normal size fat globules are 22µm.
2. This process breaks fat globules into smaller size of 1µm or less by mechanical treatment.
3. Surface area of fat particles increased resulting better digestion.
4. Homogenization and pasteurization conducted in tandem.

Milk Pasteurization

- *It refers to the process of heating every particle of milk at a specific temp. for a specific period in a standard and properly operated equipment and immediately cooling after heating.*

Milk Pasteurization

Objectives

- To extend self life.
- Safety for human consumption.
- Preserve sensory quality.

Milk Pasteurization

Methods

HTST(High temp. Short Time): 15 sec. at 71.6 ºC. Then cooling rapidly to 4 ºC.

UHT (Ultra High Temp.): 2 sec at 137.8 ºC. Then cooling rapidly to 4 ºC.

A pasteurizer machine

Thank you