CALF REARING

Current
The Conventional system

- Raising calves is labor intensive and costly
- Farmers hardly afford to give milk to calves.
- This leads towards their high mortality rate.
- Mainly because of poor management & lack of
  - Naval cord disinfection
  - Timely colostrums feeding
  - Timely De-worming.
- Furthurmore
  - Inadequate feed resources &
  - Imbalanced conventional feeding practices
    - Leads to low growth rate in calves


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Current
The Conventional system

- Same situation in the peri-urban commercial dairy farms
  - Male calves
    - Either sold or
    - Slaughtered within first week of age
  - Female calves are kept----
    - that also in groups and
    - at very low level of management

NO CONCEPT OF CALF CAGES & STANDARD PRACTICES

Scientific Approach

- Basics
- Colostrum
- Liquid Feeding
- Rumen Development
- Dry Feeds & Water
- Management Practices

Goal of Rearing

From calf → **To cow**

- healthy growth
- rumen development

- high yield
- good developed
- roughage eater

Goal of Rearing

Calf Rearing

calves born today
are
the dairy cows of tomorrow

For this reason:

Good calf rearing is
important
for the continuity of your farm

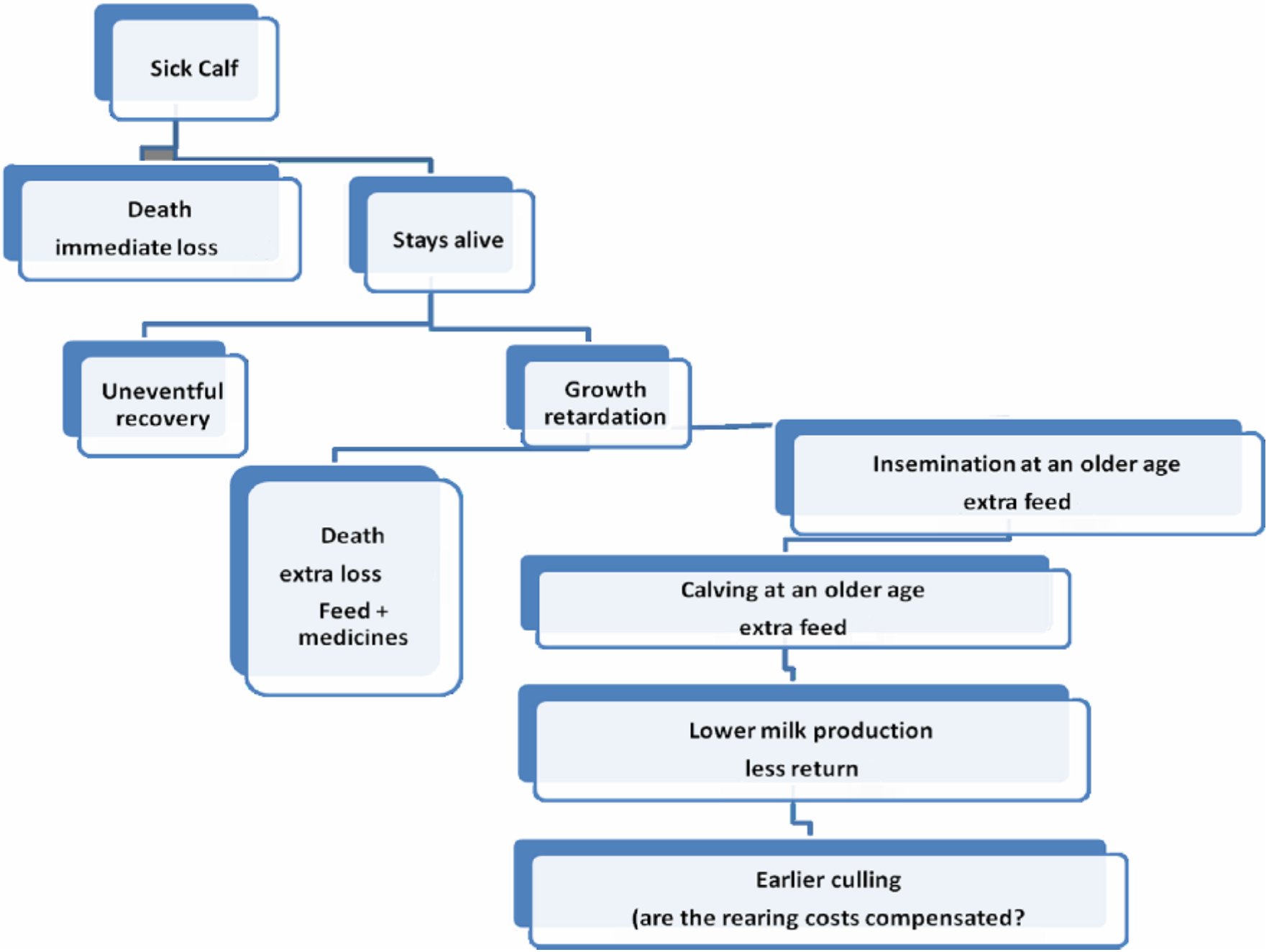
OBJECTIVES

SUCCESSFUL RAISING PROGRAM

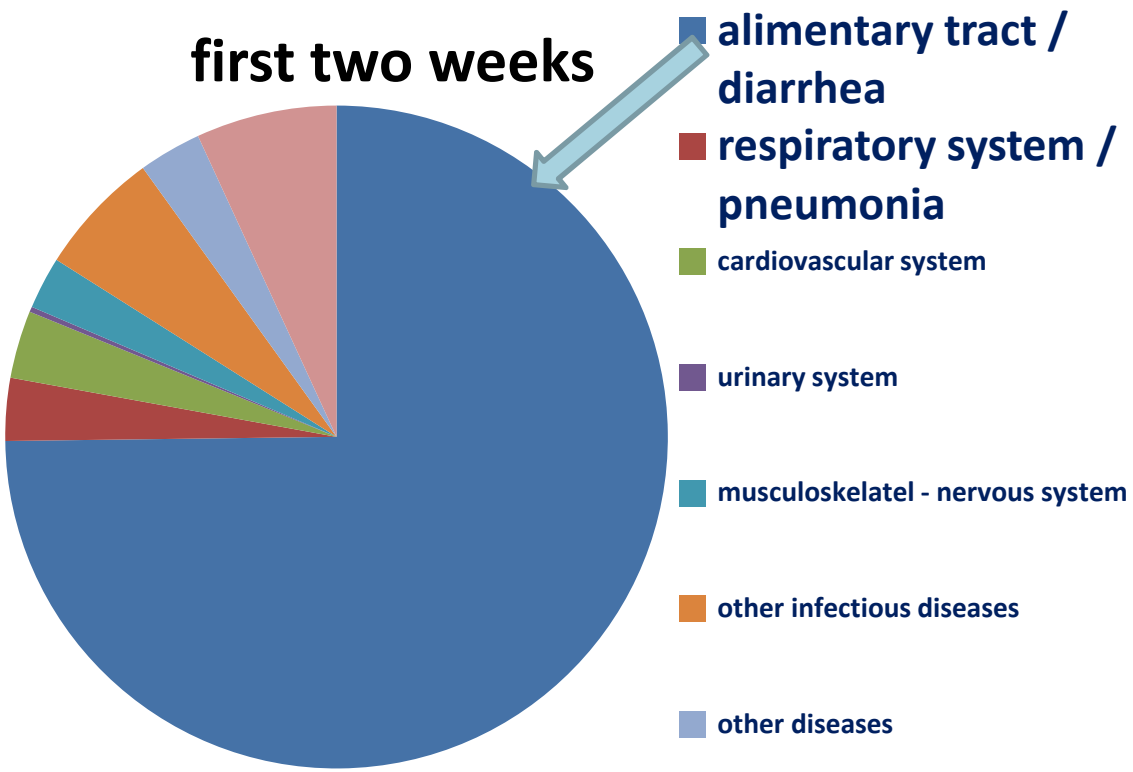
Calves are Alive

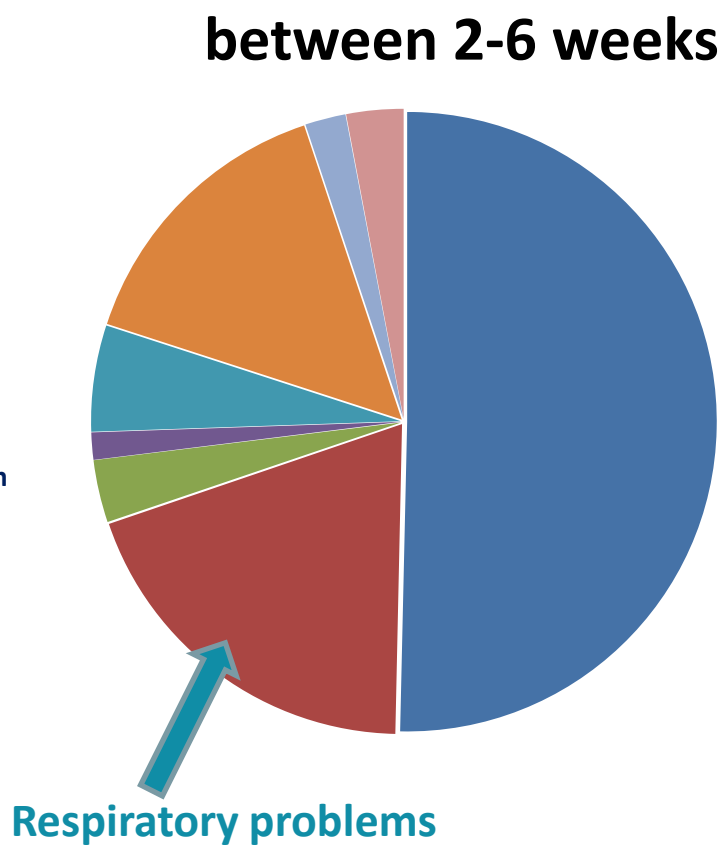
Calves are Healthy

Calves are Growing Well


Sick Calf
Death
immediate loss
Stays alive
Uneventful recovery
Growth retardation
Death
extra loss
Feed + medicines
Insemination at an older age
extra feed
Calving at an older age
extra feed
Lower milk production
less return
Earlier culling
(are the rearing costs compensated?

Causes of death of calves born alive





- Basics
- **Colostrum**
- Liquid Feeding
- Rumen Development
- Dry Feeds & Water
- Management Practices

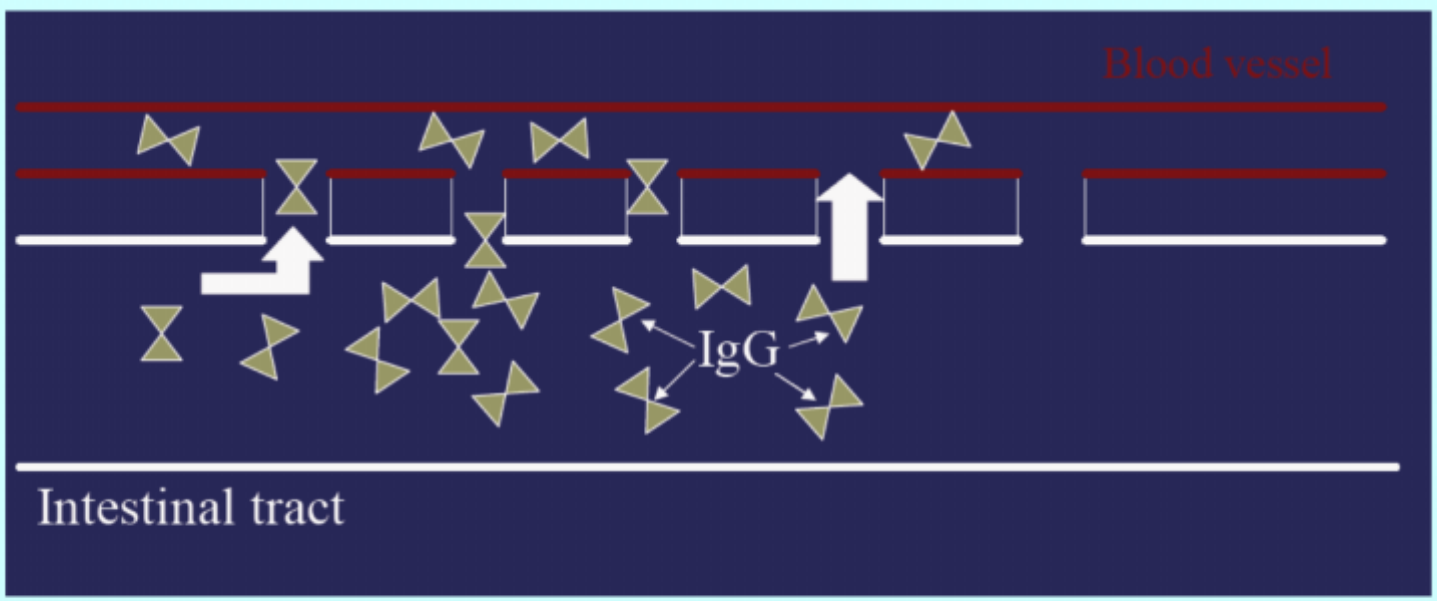
COLOSTRUM

" Thick, creamy, yellow, sticky first secretion from the mammary gland in first 24 hours after calving, it contains immunoglobulin, nutrients and growth factors that, when absorbed by the calf's gut, resist disease challenges and helps good growth"

COLOSTRUM

Colostrum Absorption

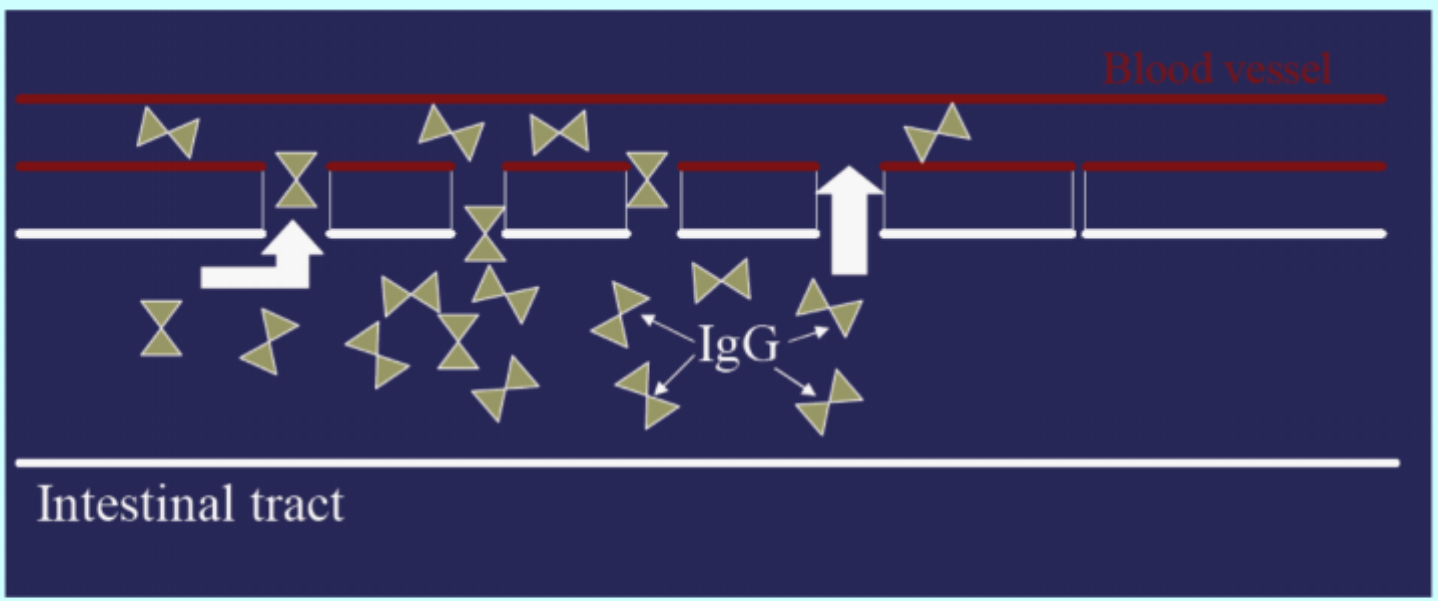
(~ 2 hours of age)



COLOSTRUM

Colostrum Absorption

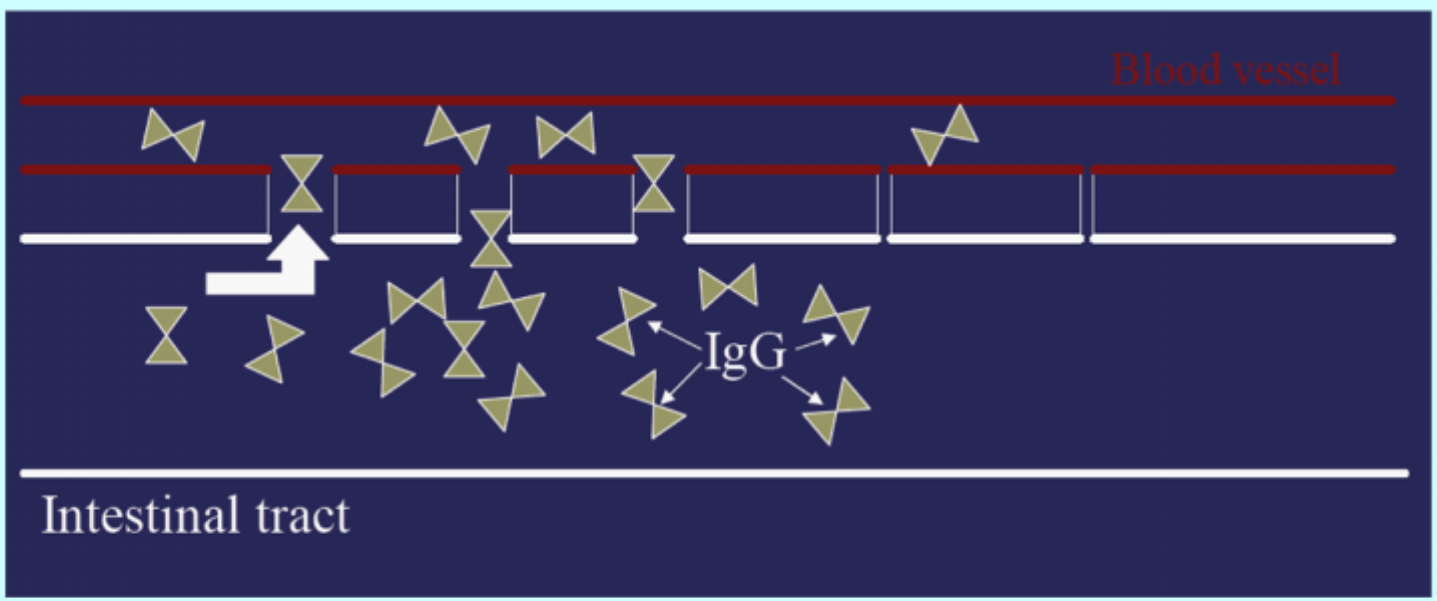
(~ 4 hours of age)



COLOSTRUM

Colostrum Absorption

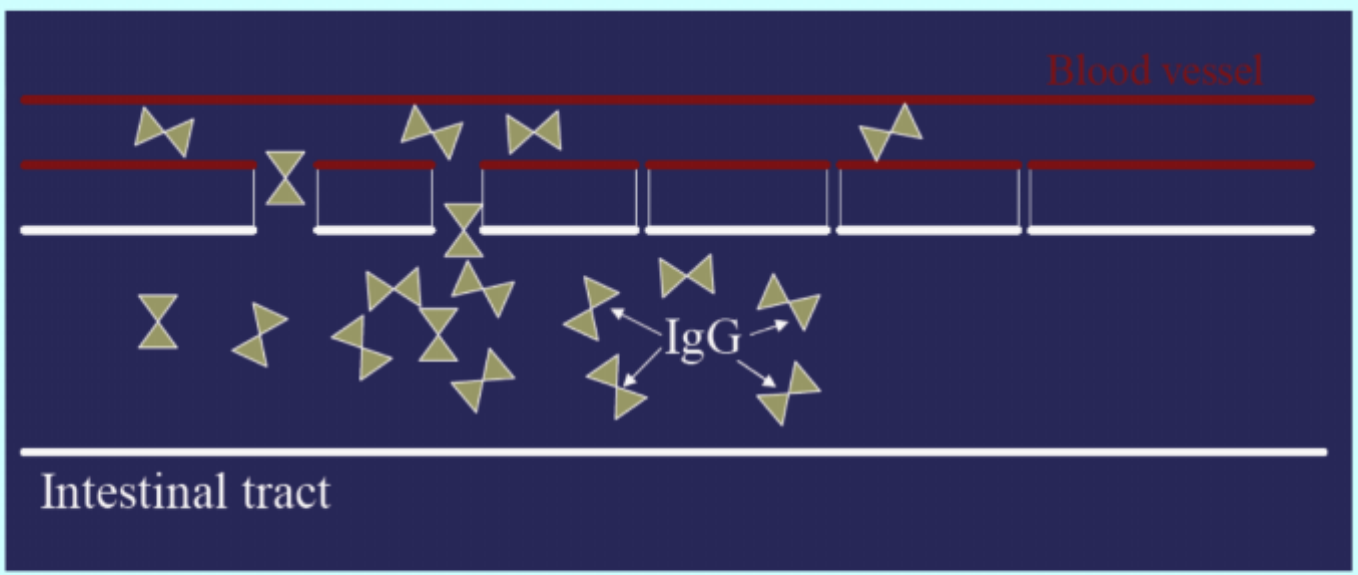
(~ 10 hours of age)



COLOSTRUM

Colostrum Absorption

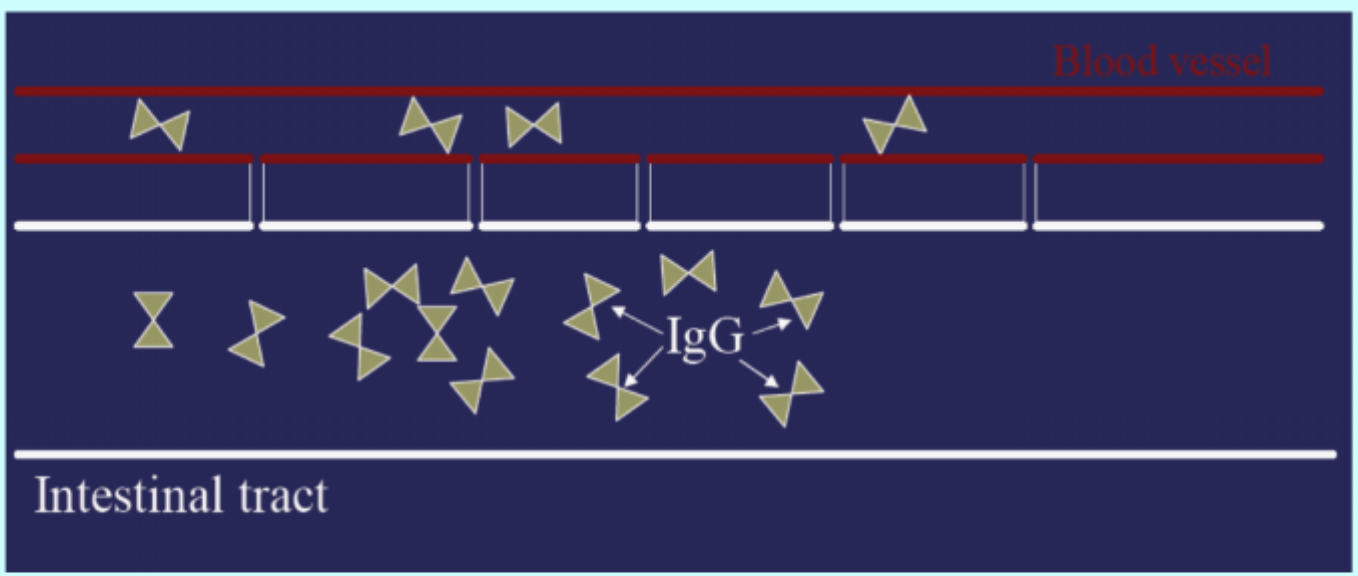
(~ 16 hours of age)



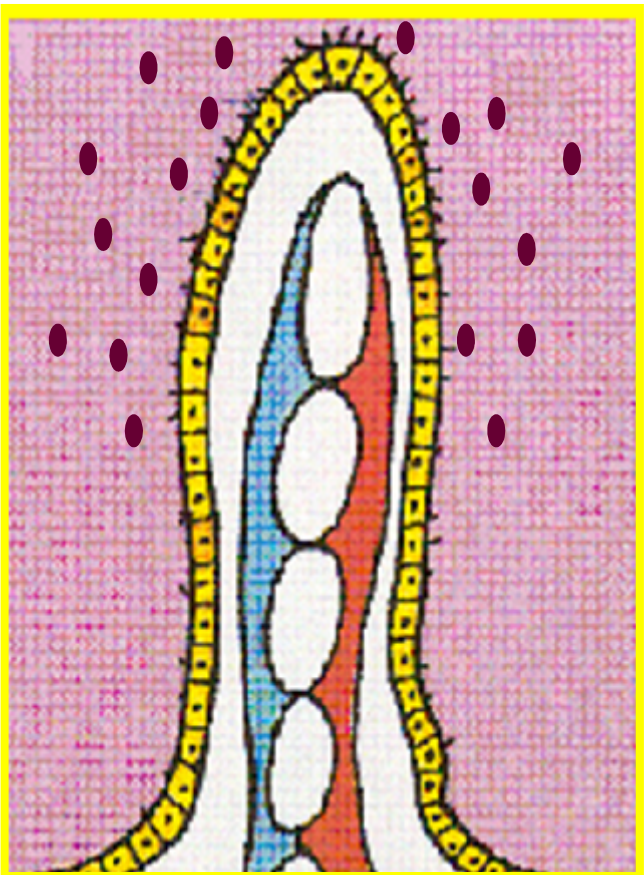
COLOSTRUM

Colostrum Absorption

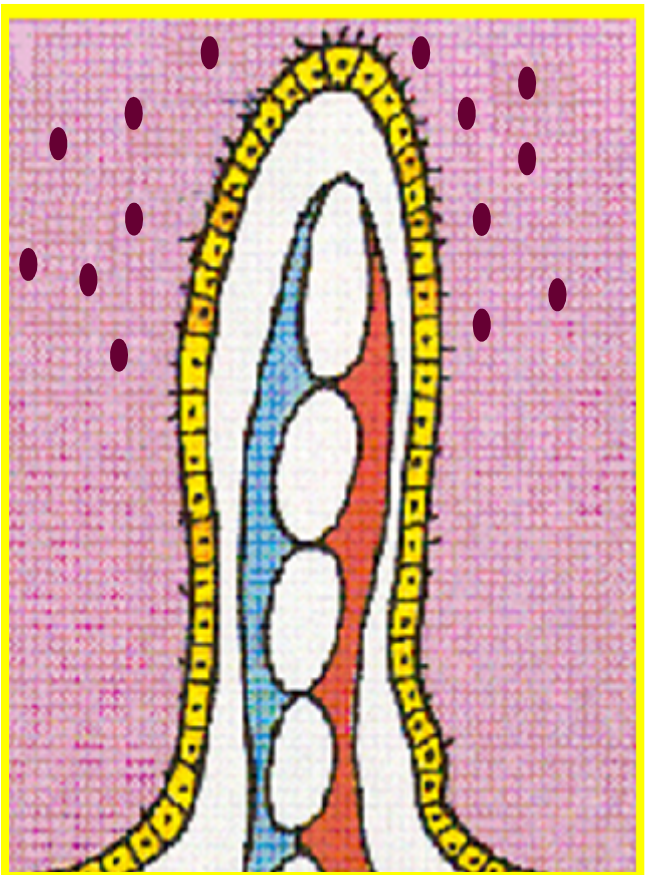
(~ 24 hours of age)



Absorption of Antibodies

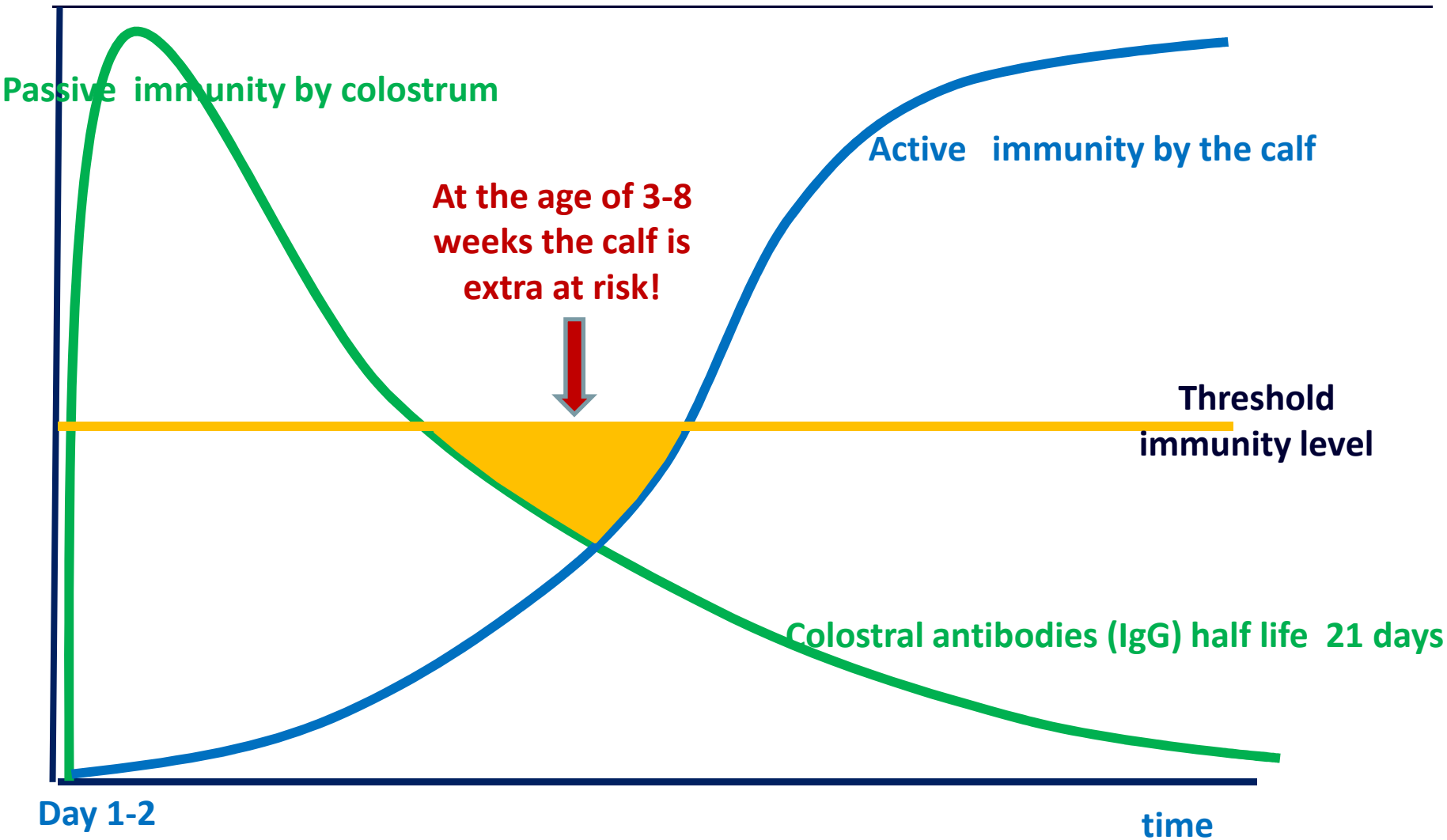


0-8 hours after birth

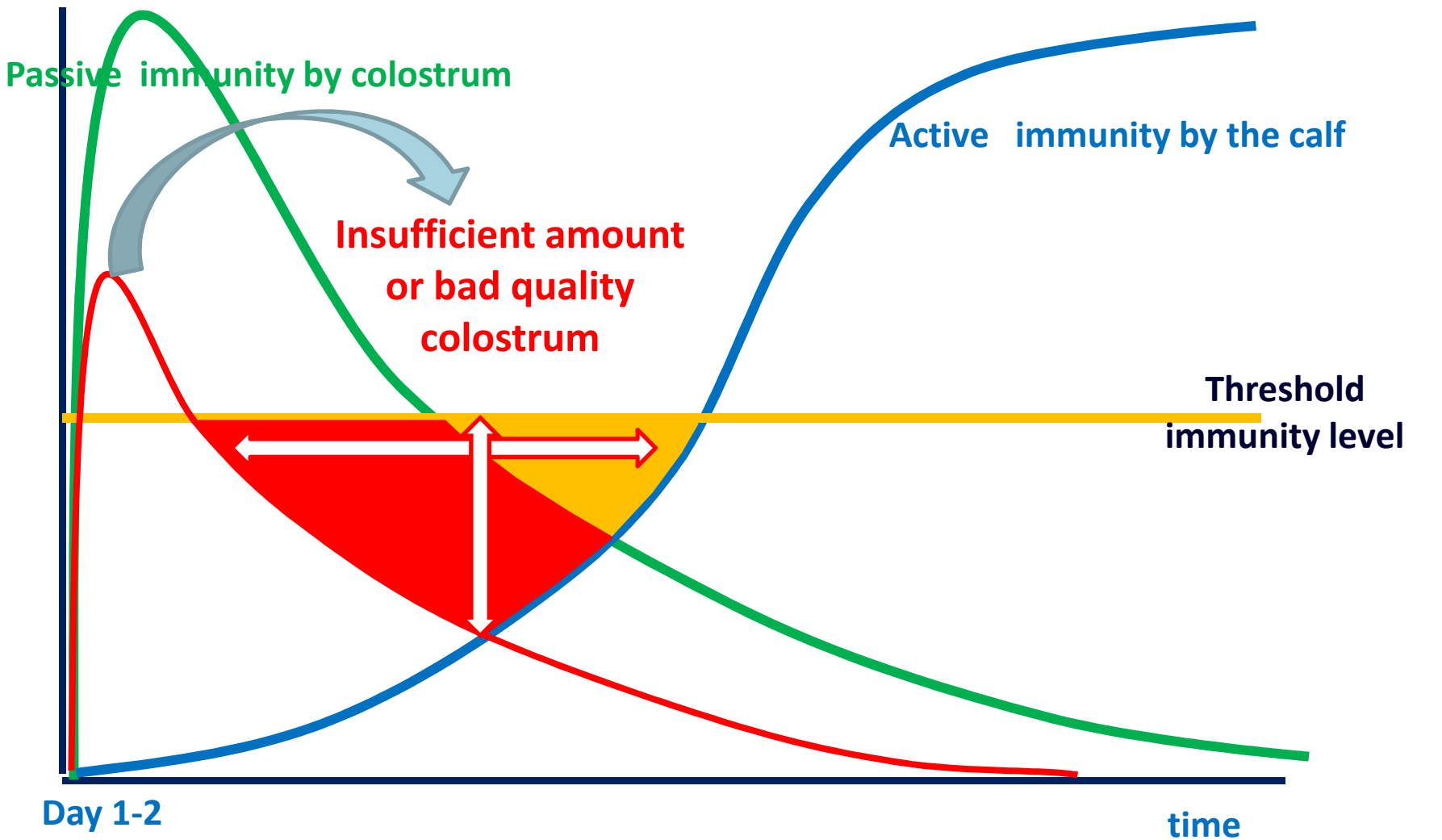


8-24 hours after birth

COLOSTRUM AND IMMUNITY



FAILURE OF PASSIVE IMMUNITY



COLOSTRUM

- The 3Q Rule

Quality
IgG >50 g/l
Low bacterial counts

Quantity
4-6 liters

Quickly
within 6-8 hours following birth

- Basics
- Colostrum
- **Liquid Feeding**
- Rumen Development
- Dry Feeds & Water
- Management Practices

LIQUID FEED

"A substance that is able to flow and meet nutrient and physical requirement of the young calf"

- There are 5 liquid feeds available for pre-weened calves:
  - Colostrum
  - Transition milk
  - Whole milk
  - Milk replacer
  - Waste and discard milk

LIQUID FEEDING SYSTEMS

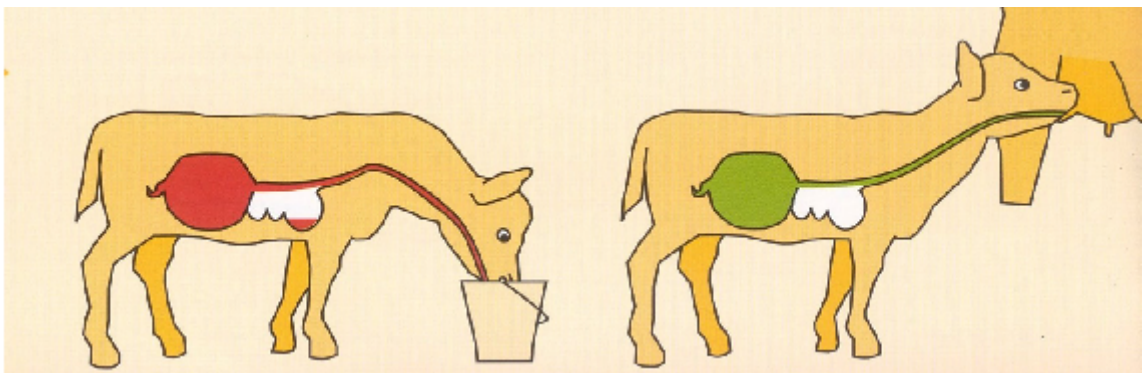
- Methods of providing liquid milk to calves.

Restricted feeding	Restricted feeding	Ad-lib feeding	Ad-lib feeding
ONCE PER DAY	TWICE A DAY	COLD	WARM
Bucket/pail-open or via teat	Bucket/pail-open or via teat	Ad-lib feeding system/mob feeders	Automatic machine/ Computer controlled feeder

LIQUID FEEDING SCHEDULE

Feed	Day 1	Day 2-4	Day 4-14 (wk 1-2)	Day 15-42 (wk 3-6)	Day 42-49 (wk 7)	Day 49-56 (wk 8)
Liquid milk feed	High quality colostrum as soon as possible	Introduce regular liquid feed	feed liquid feed increasing gradually over first week	Feed liquid feed according to chosen feed program	Start weaning process, reduce milk feed by 25-50% to encourage calf starter intake	Stop liquid milk feed when calf meets weaning criteria
Calf starter			Ad lib Fresh daily	Ad lib Fresh daily	Ad lib Fresh daily Ensure sufficient available	Ad lib Fresh daily Calf eating 1 kg/day for 3 consecutive days
Water		Encourage drinking by offering 20 mins after milk feed	Ad lib fresh daily Typically 1-2 l/day	Ad lib fresh daily	Ad lib fresh daily	Ad lib fresh daily

HOW TO FEED LIQUID



~~Bucket on the floor!~~

Nipple feeding at 70 cm!

HOW TO FEED LIQUID

MILK REPLACER

"A blended powder formulation based on dried products from the milk processing industry, fats and oils, minerals, vitamins and additives"

MILK REPLACER

VISUAL ASSESSMENT

Parameter	Acceptable	Not acceptable
Dry Powder		
Colour	Off white, cream to light tan	Orange - brown
Smell	Pleasant , bland	Caramelized smell Petroleum , paint, grass
Consistency	Free from lumps	Large lumps, caking
Reconstituted liquid		
Colour	Cream to very light tan	Dark , bitty
Smell	Pleasant , milky	Sour milk smell
Taste	Sweet , milky, sweet - tart	Off flavour
Consistency	Uniform	Lumps , dark particles


SPRAYFO


24 10 2007


24 10 2007


TWIN
CALFMOM
CALFMOM

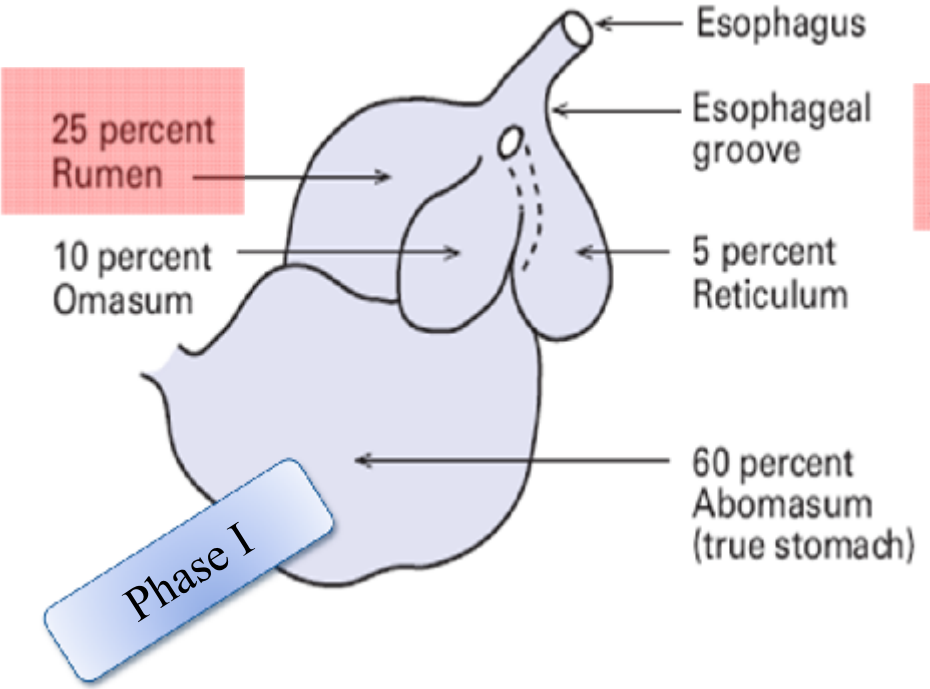

CALF BEGINNER
Urban
Urban

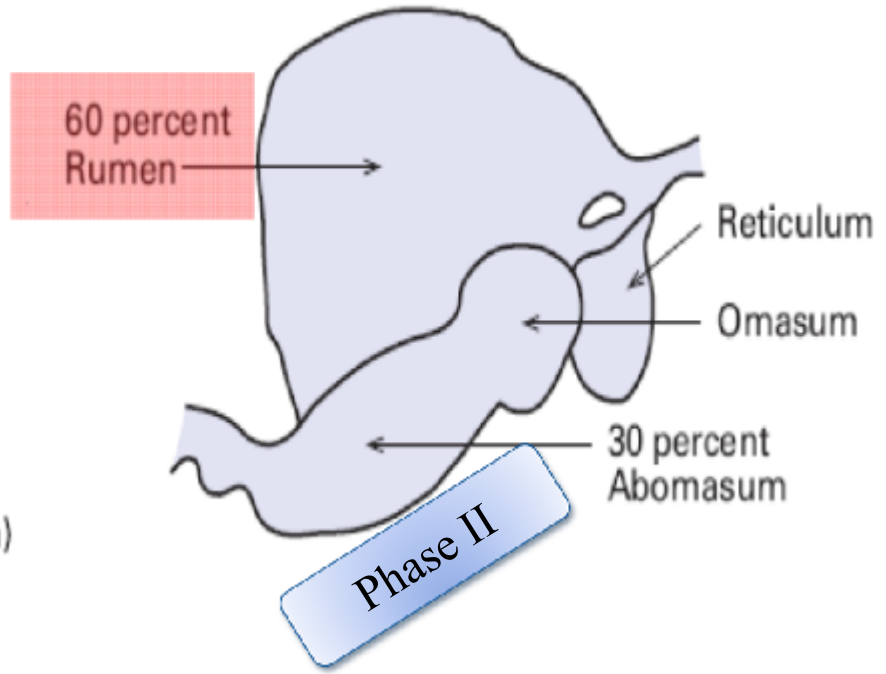
- Basics
- Colostrum
- Liquid Feeding
- **Rumen Development**
- Dry Feeds & Water
- Management Practices

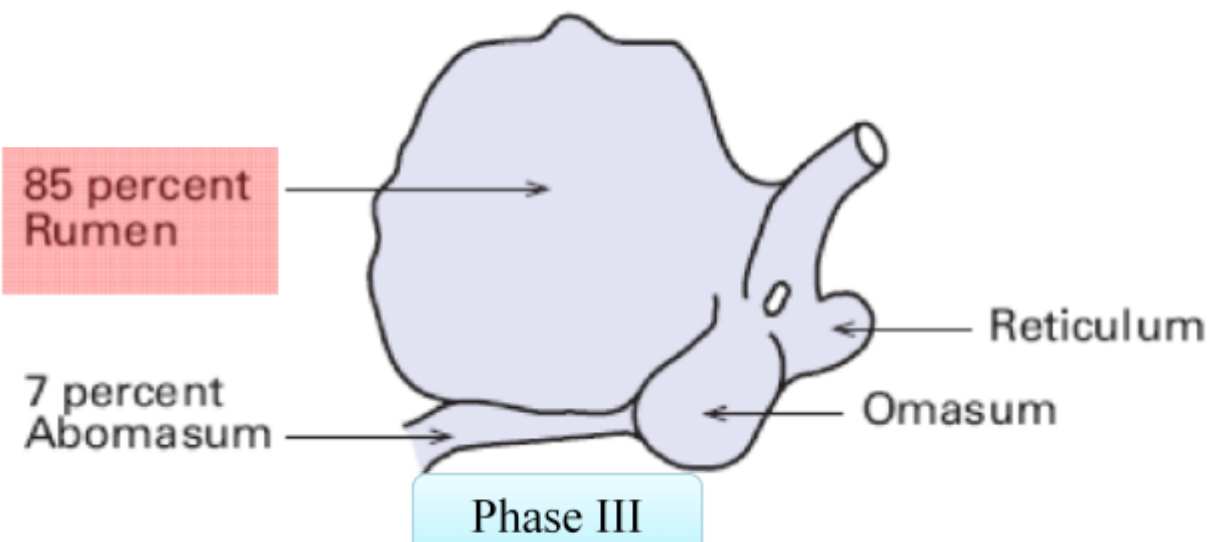
RUMEN DEVELOPMENT

Stages of development

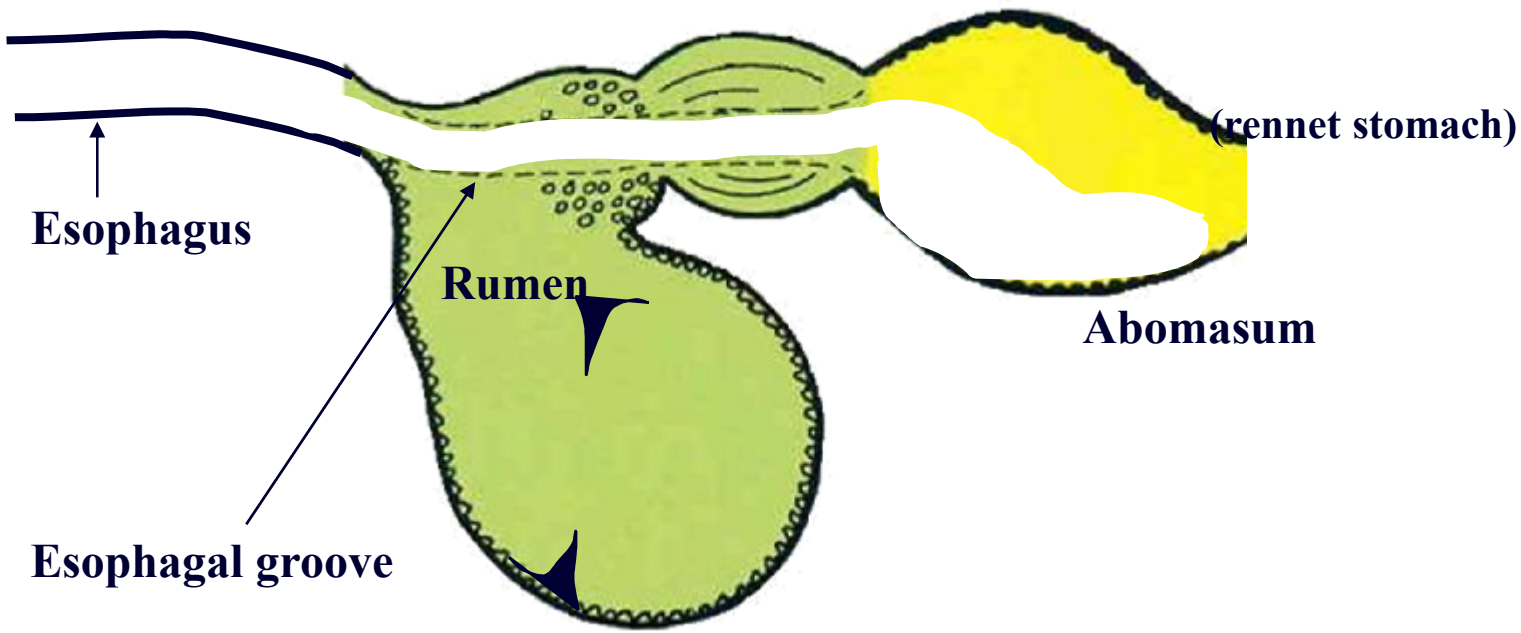
Stages	Age	Primary digestive organ	What diet is suitable
Pre - ruminant	0-3 weeks	Abomasum	Liquid (colostrum, milk, milk replacer)
Developing ruminant	4-8 weeks	Abomasum+ Rumen	Liquid + solid (starter)
Ruminant	8 weeks +	Rumen	Solid (starter , forage) + water


Esophagus
25 percent Rumen
Esophageal groove
10 percent Omasum
5 percent Reticulum
60 percent Abomasum (true stomach)
Phase I


60 percent Rumen
Reticulum
Omasum
30 percent Abomasum
Phase II


85 percent Rumen
Reticulum
7 percent Abomasum
Omasum
Phase III

Feed Flow

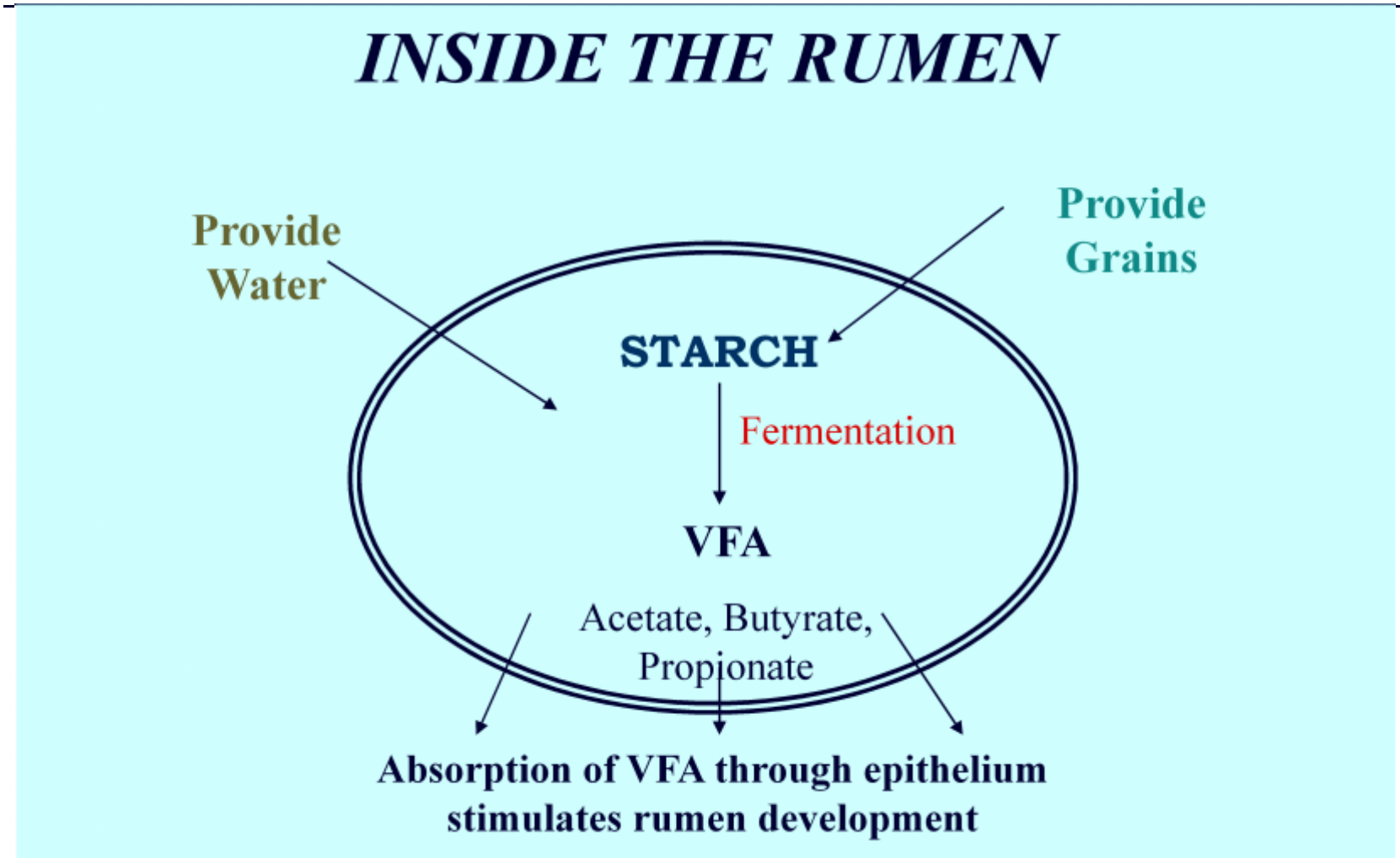

(rennet stomach)
Esophagus
Rumen
Abomasum
Esophagal groove

RUMEN DEVELOPMENT

Factors Required for Rumen Development

- Establishment of bacteria
- Water-based environment
- Substrate availability
- Muscular development
- Absorptive ability of tissue (rumen papillae)

RUMEN DEVELOPMENT



Comparison of Rumen Development at 6 weeks of age

Fed Milk Only

Milk and starter feed

Milk and dry hay

- Basics
- Colostrum
- Liquid Feeding
- Rumen Development
- **Dry Feeds & Water**
- Management Practices

CALF STARTER

Dry starter feed consumption is the primary factor in early rumen development

"The first solid dry feed that is fed to young calves."

A high quality complete feed made from grain, protein sources and fortified with vitamins and minerals for feeding to the young calf from 3 days to 12 weeks of age.

COMPOSTION OF CALF STARTER

(An Example)

S #	Ingredients Formulation	% age
1	Ground Maize	46
2	Soybean Meal	17
3	Canola Meal	11
4	Vegetable Oil	3.5
5	Rice Polish	13
6	Molasses	6.5
7	Mineral Mix	1
8	Vitamins (A,D3,E,K& B Complex)	1
9	Lime (Calcium)	1
TOTAL		100


Daily

CALF MANAGEMENT

- HOUSING
- PATHOGEN CONTROL

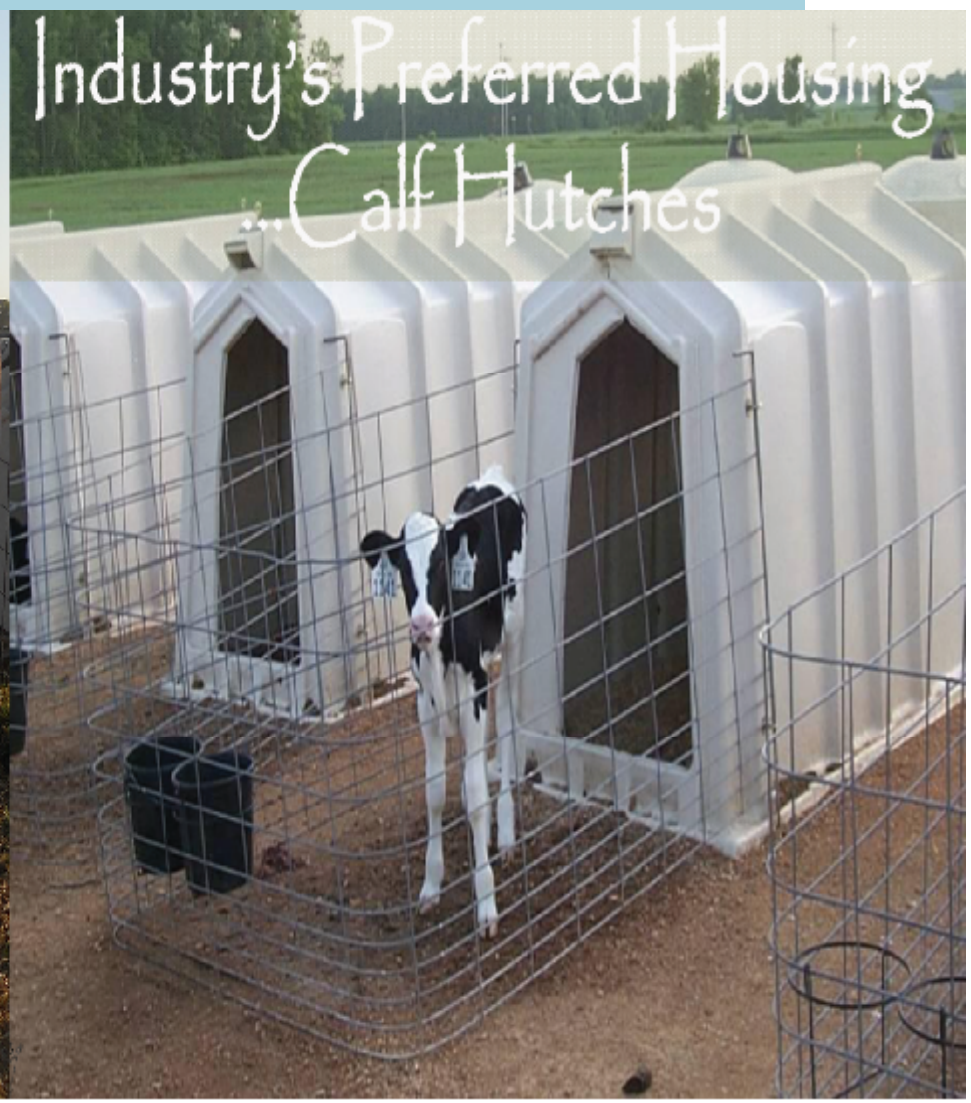
Housing- Environment

The conditions immediately surrounding the calf.

- Environmental conditions surrounding the calf are affected by:

    1. Air movement / ventilation
    2. Air quality
    3. Humidity
    4. Temperature
    5. Bedding

INDIVIDUAL HOUSING



INDIVIDUAL HOUSING

How Many Individual Calf pens

- ✓ **Depends on the calving pattern and how long the calf will stay in the individual pen**
  (For few days---OR---- Till weaning---
  OR--Also some period of post weaning----!!!!)

- ✓ **As a general standard 12-15 % of the number of milking cows**

CALF MANAGEMENT

Restriction of Movement

CALF MANAGEMENT

Sanitation

- Sanitation is critical to breaking the disease cycle.
- Disinfect
  - Choose the right disinfectant for the job

CALF Management Summary

6 C's Toward Success

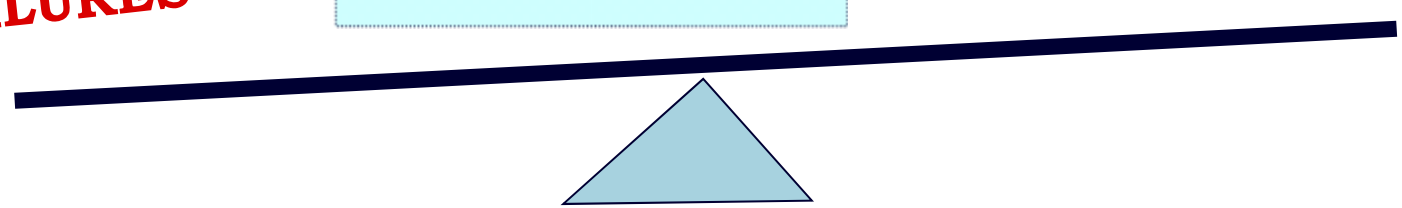
- Colostrum
- Comfort
- Cleanliness
- Consistency
- Calories (Nutrition)
- Care (Medication & Vaccination)

FAILURES

- **Pneumonia**
- **Scours**
- **Death**

SUCCESSES

- ✓ **Live Calf**
- ✓ **Health**
- ✓ **Growth**



Thanks