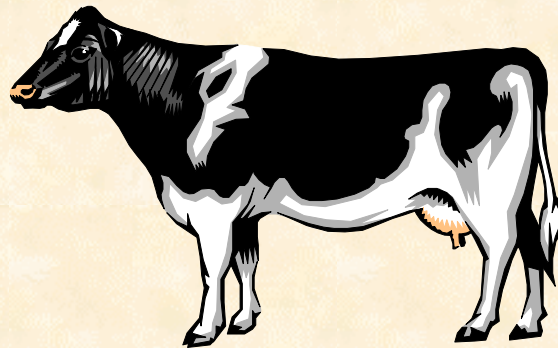


Disease Causation



Pamela Ruegg, DVM, MPVM
Universidad de Wisconsin

Why are some herds healthier than others??



El Plan

- Define disease
- Causes of disease in herds
- Impact of disease on productivity
- Discuss disease prevention

DISEASE

- Clinical Disease
 - Easily detectable abnormality of function
- What are some clinical signs of disease?

Fever

Anorexia

Decreased Production

Abnormal Milk



DISEASE

- Subclinical Disease
 - Abnormality of function detectable only by laboratory tests or diagnostic aids
- What are some subclinical diseases?



Subclinical mastitis

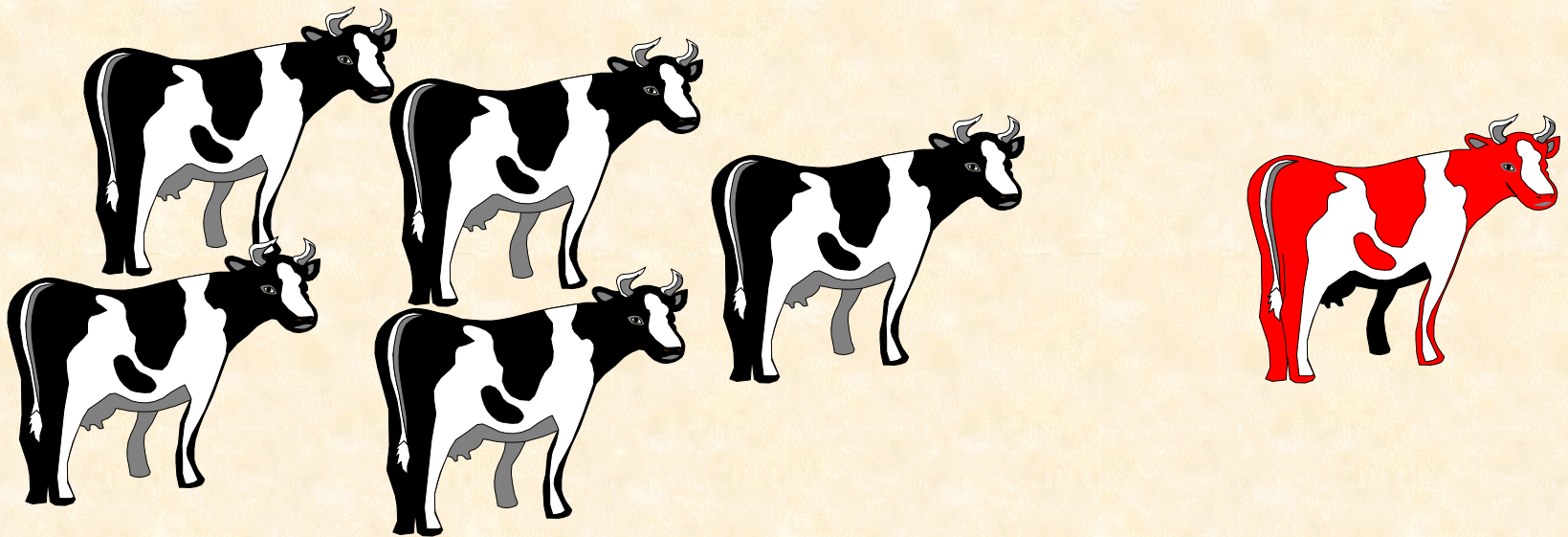
Subclinical ketosis

Johne's Disease

Decrease

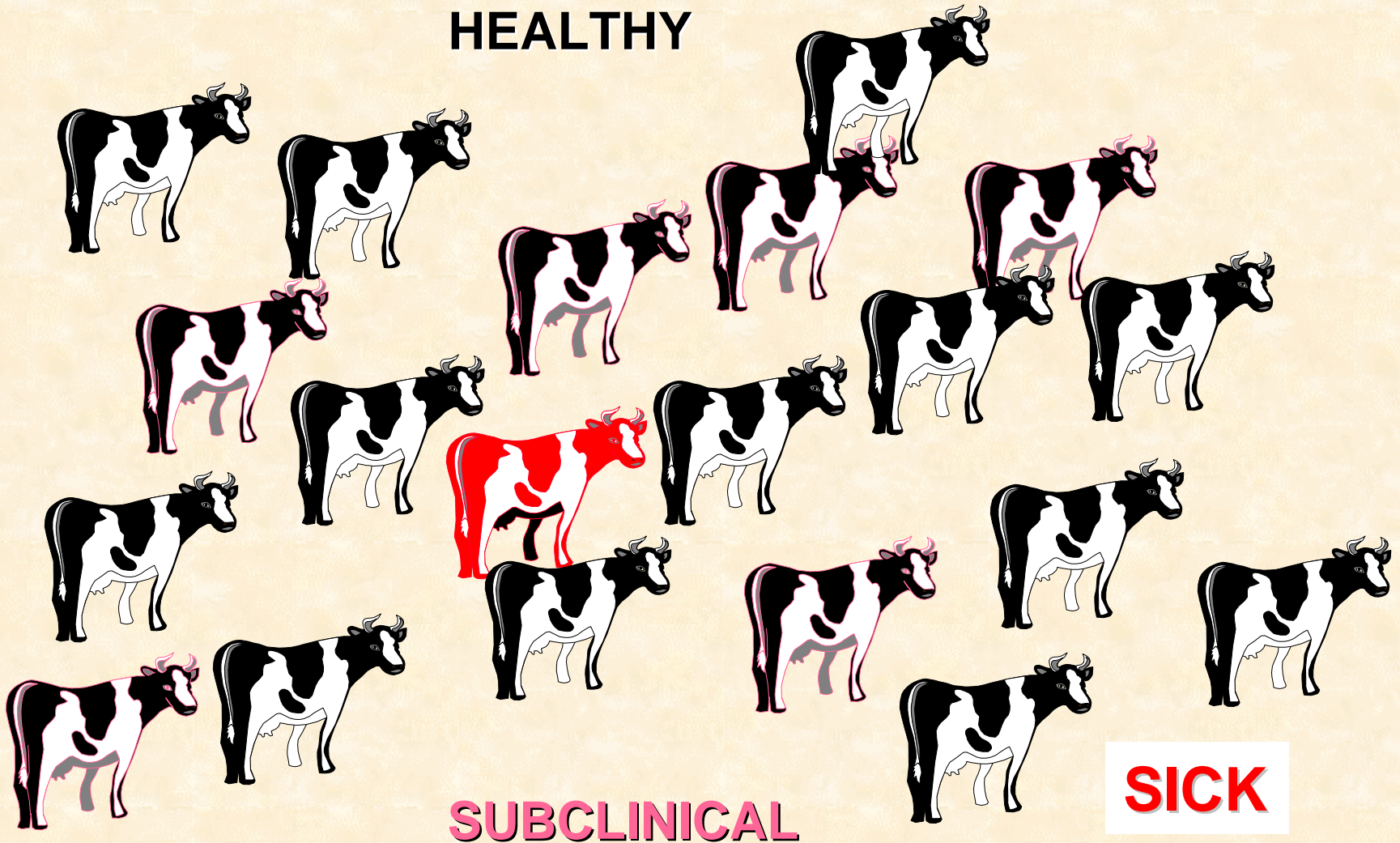
Production

The number of subclinically diseased cows is generally greater than the number of clinically diseased cows



Population of Animals on Farm

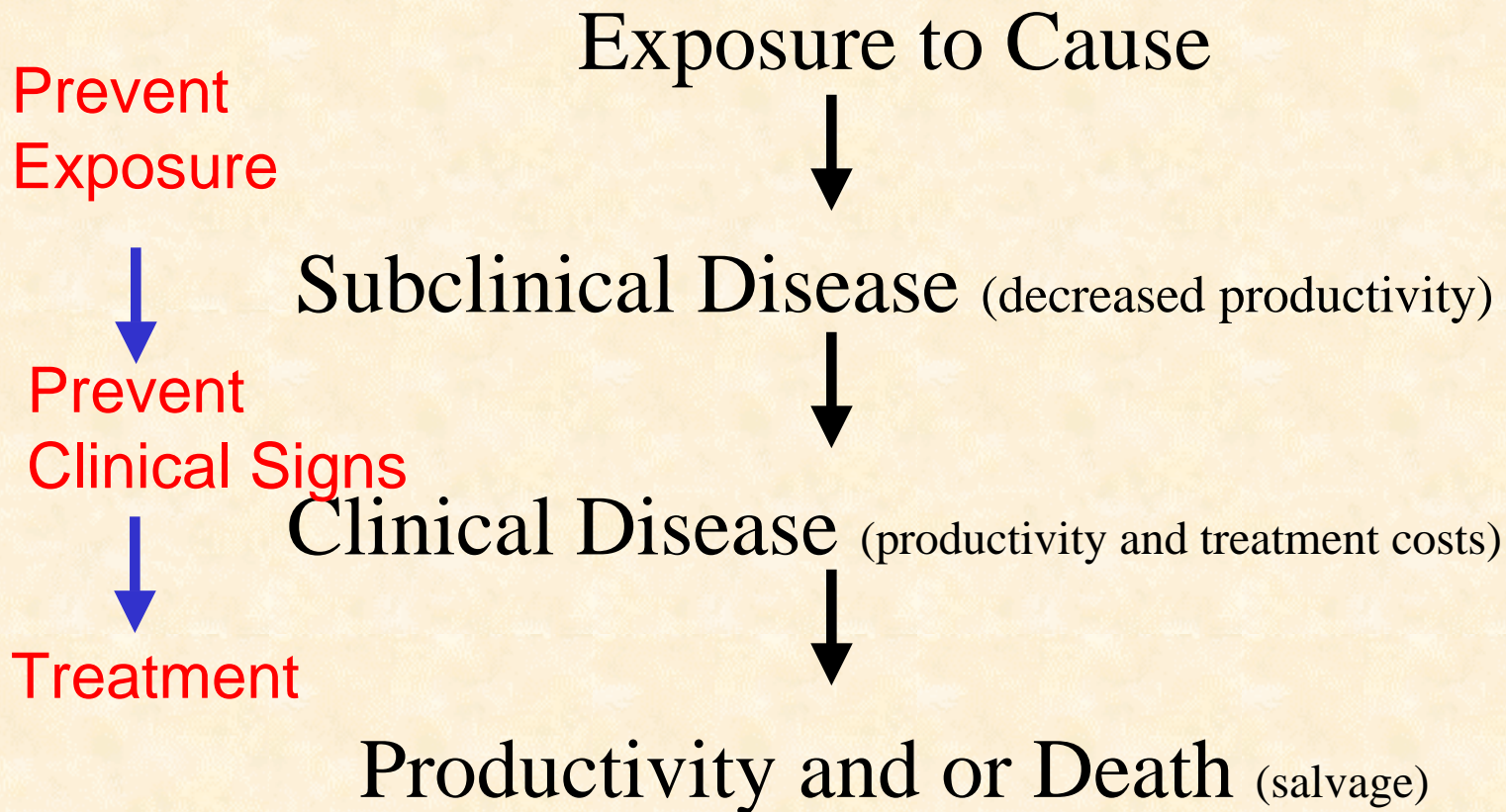
HEALTHY



SUBCLINICAL

SICK

Development of Disease



Example: Mastitis

Disease Stages	Mastitis	Prevention
Exposure to cause	Bacteria gain entry into udder	Good milking management; good environment
Subclinical Disease	Increased somatic cells; reduced production	Dry cow therapy; sometimes lactating cow therapy
Clinical Disease	Abnormal milk, sick cow	Intramammary and systemic antibiotics

Prevention of Disease

Prevention of Exposure

- **Identify risk factors for exposure**

- number cows infected
- type of organisms present
- purchase of infected animals
- transmission between animals

- **Prevent exposure**

- identify infected animals
- quarantine
- vaccination
- good husbandry - environment
- good nutrition



Prevention of Disease

Prevent Clinical Disease

- Early detection before clinical
 - Somatic Cell Counts
 - Examination of the reproductive tract
 - Screening tests for TB and Brucellosis



Prevention of Disease Treatment



FOR INJECTION
REFRIGERATE

ADVERSE
EFFECTS

NET CONTENTS

4-11-98

9-10-98

Domayma[™]
Bolus

Usage:
Horses - 10 to 20 Bolus, Cattle - 1 to 1 1/2 Bolus, Cows and Calves - 1/2 Bolus. Repeat at 4 hour interval with if indicated.

Endomayma is relatively non-toxic and may be given freely in amounts to effect.

ESSAR CORPORATION

10 Bolus (each)

Oxborn

Cefa-Lak[®]
CEPHAPIRIN SODIUM

FOR INTRAMAMMARY INFUSION FOR
LACTATING COWS

Each syringe contains 200 mg of Cephapirin activity as cephapirin sodium.
Contains 12 x 10 mL Syringes

Cefa-Lak[®]
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ADVERSE WARNINGS

LOT 8304

ADVERSE WARNINGS

LOT 8304

ADVERSE WARNINGS

LOT 8304

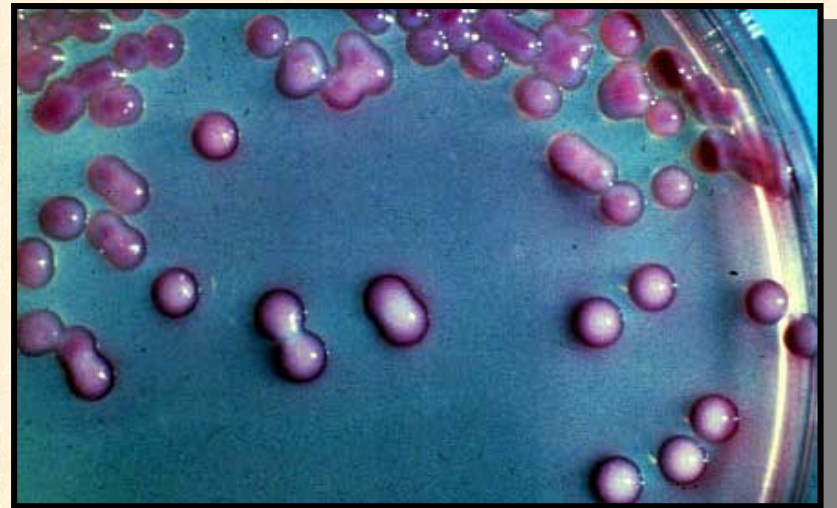
Prevention and control of disease
in populations is more important
for productivity than treatment of
individual animals

Take Back to the Barn

- ➡ Clinical disease can be seen but generally affects few animals
- ➡ Subclinical diseases is not seen but may affect large numbers of cows
- ➡ Subclinical disease limits profitability more than clinical disease
- ➡ Prevention of disease is more cost effective than treatment

**Few diseases have a
single cause**

**Does an infection
with an agent of
disease always
lead to clinical
disease?**



WHY NOT?

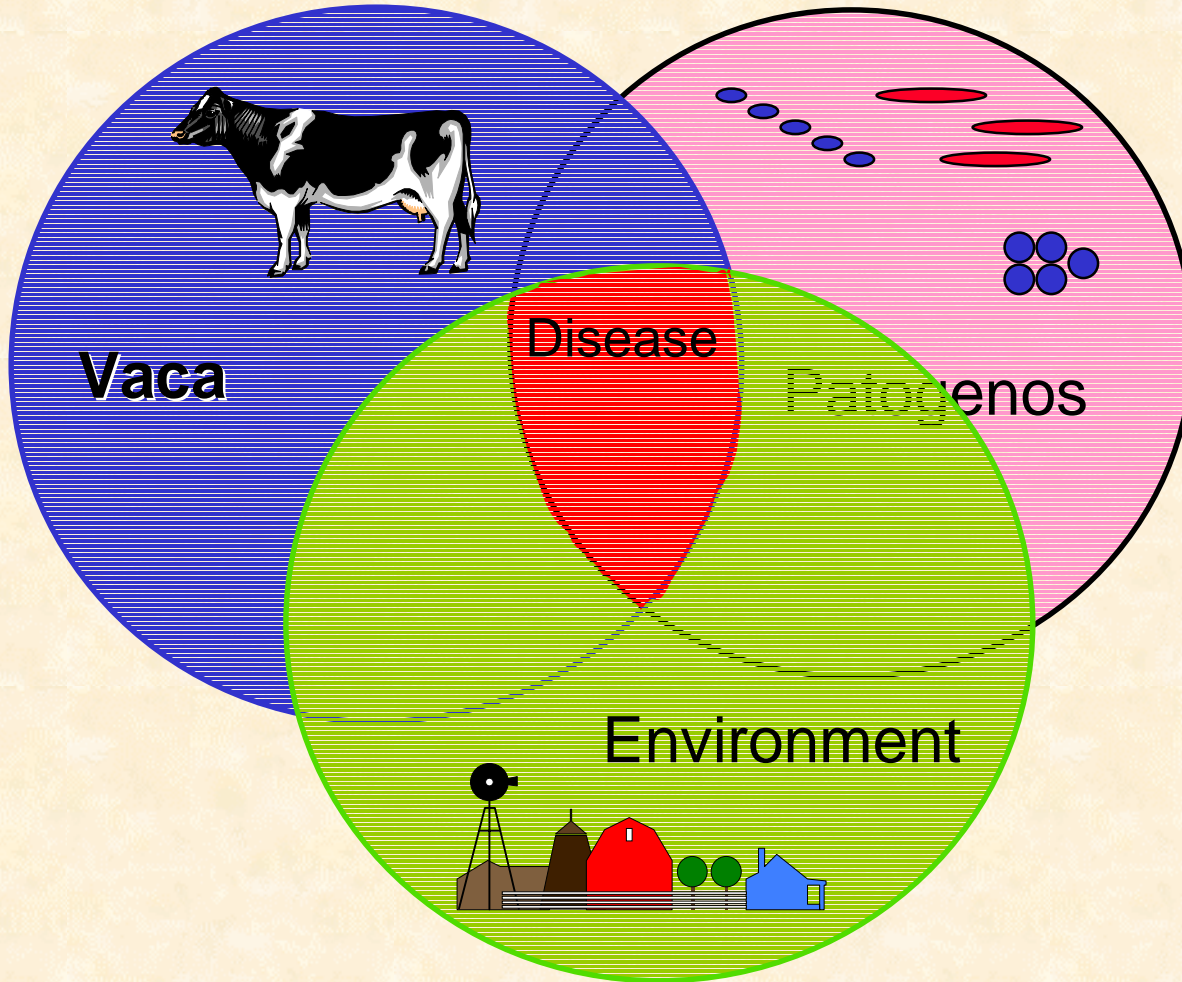
**Disease can limit
productivity but
bigger limitations
are often
management
decisions, housing
and feeding
decisions**



Management for optimum productivity is based upon managing groups of similar animals to minimize disease and maximize productivity



The Development of Disease



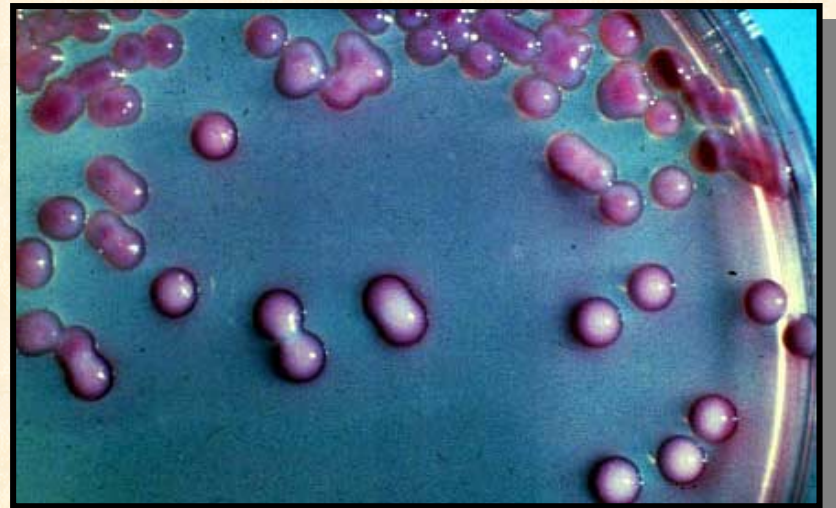
Factors de vaca

- Age
- Breed
- Gender
- Immune Status
- Level of Production
- Udder conformation
- Stage of Lactation



Factors de patogenos

- Exposure
 - level of exposure
- Pathogenicity
 - ability to cause disease
- Virulence
 - level of severity of disease

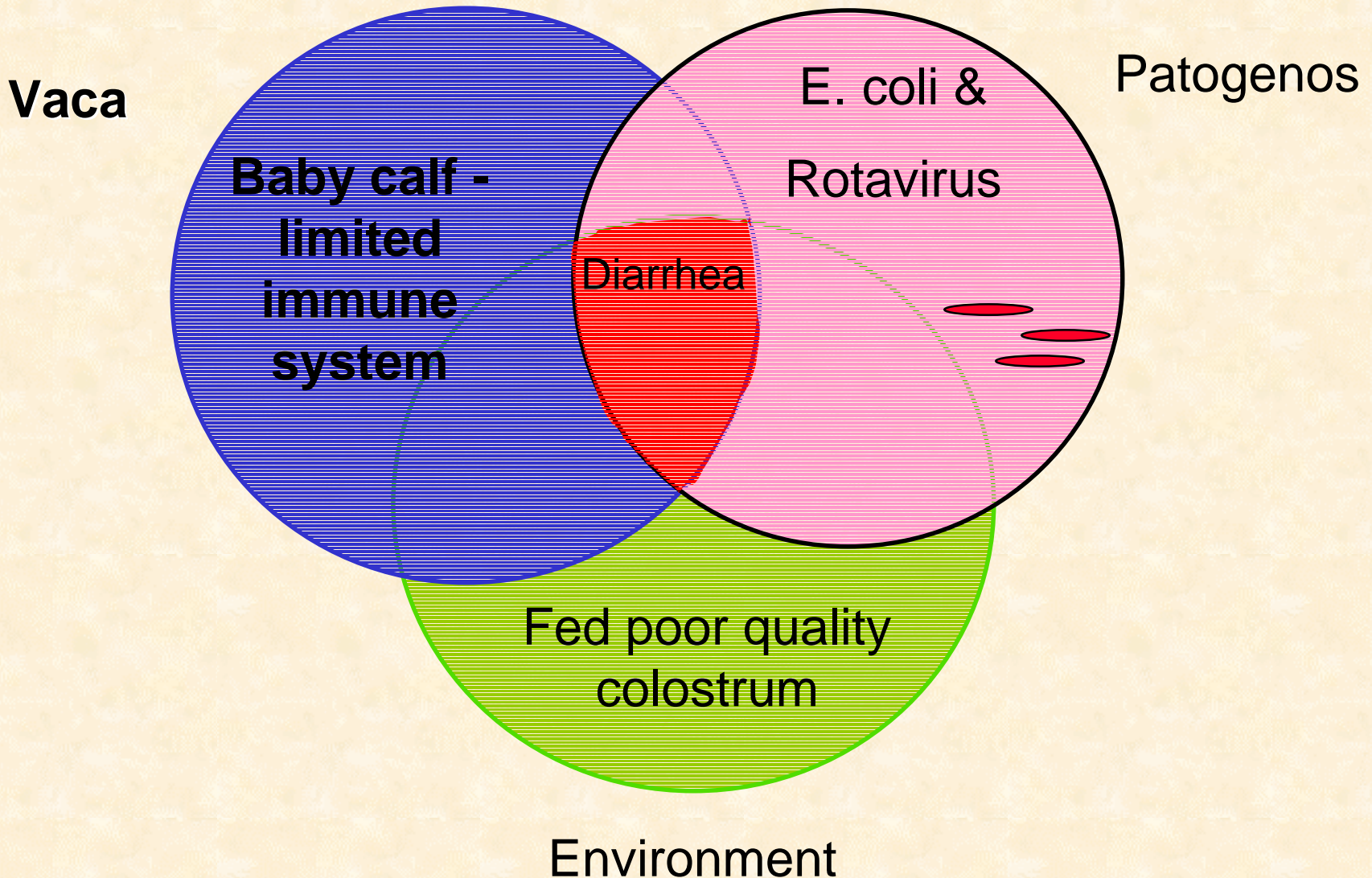


Factors de ambiente

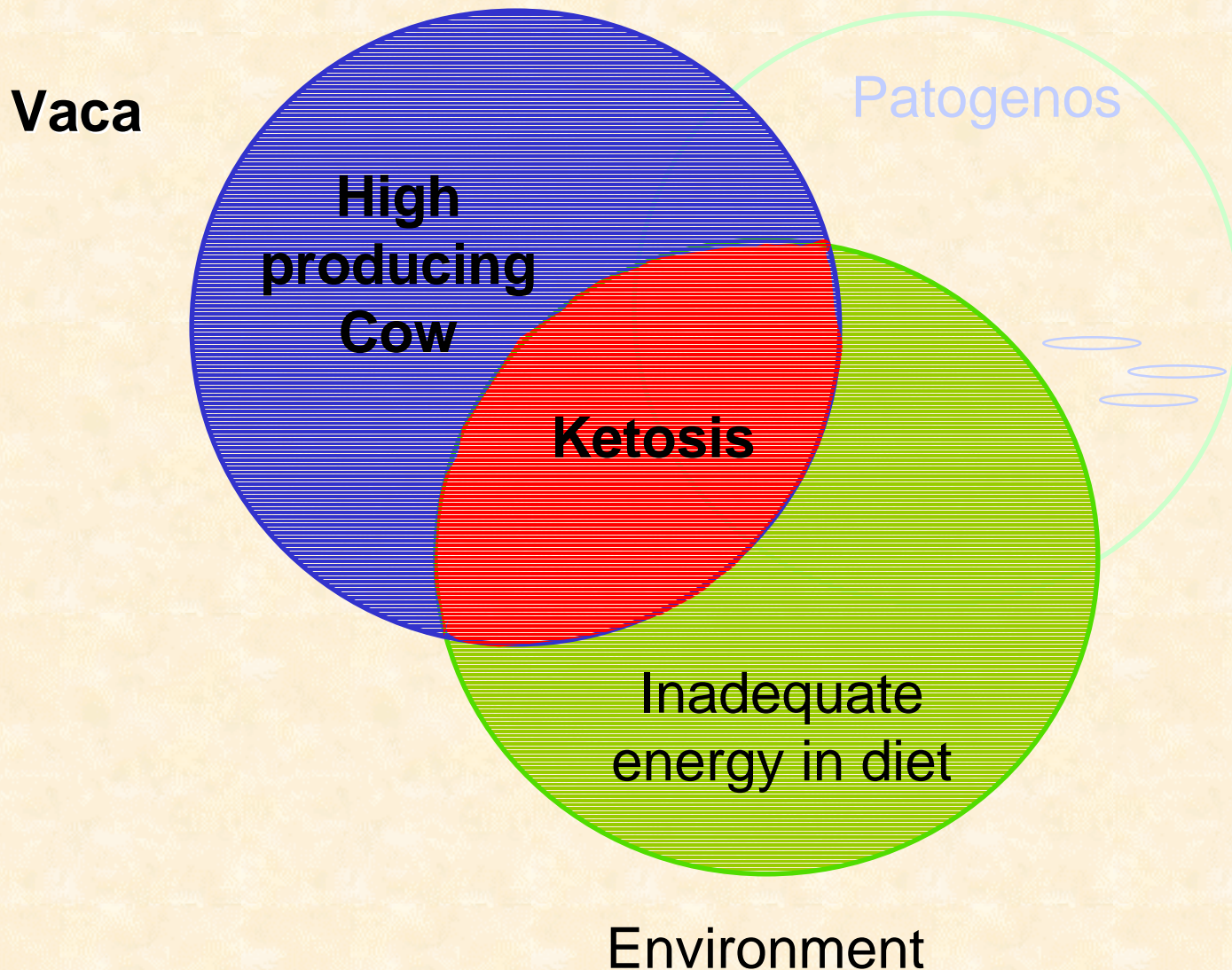
- Management of environment
 - minimize stress
 - minimize exposure
- Milking procedures
- Weather
- Nutritional program
- Grouping
- Housing
- Cow Comfort



Example: Infectious disease

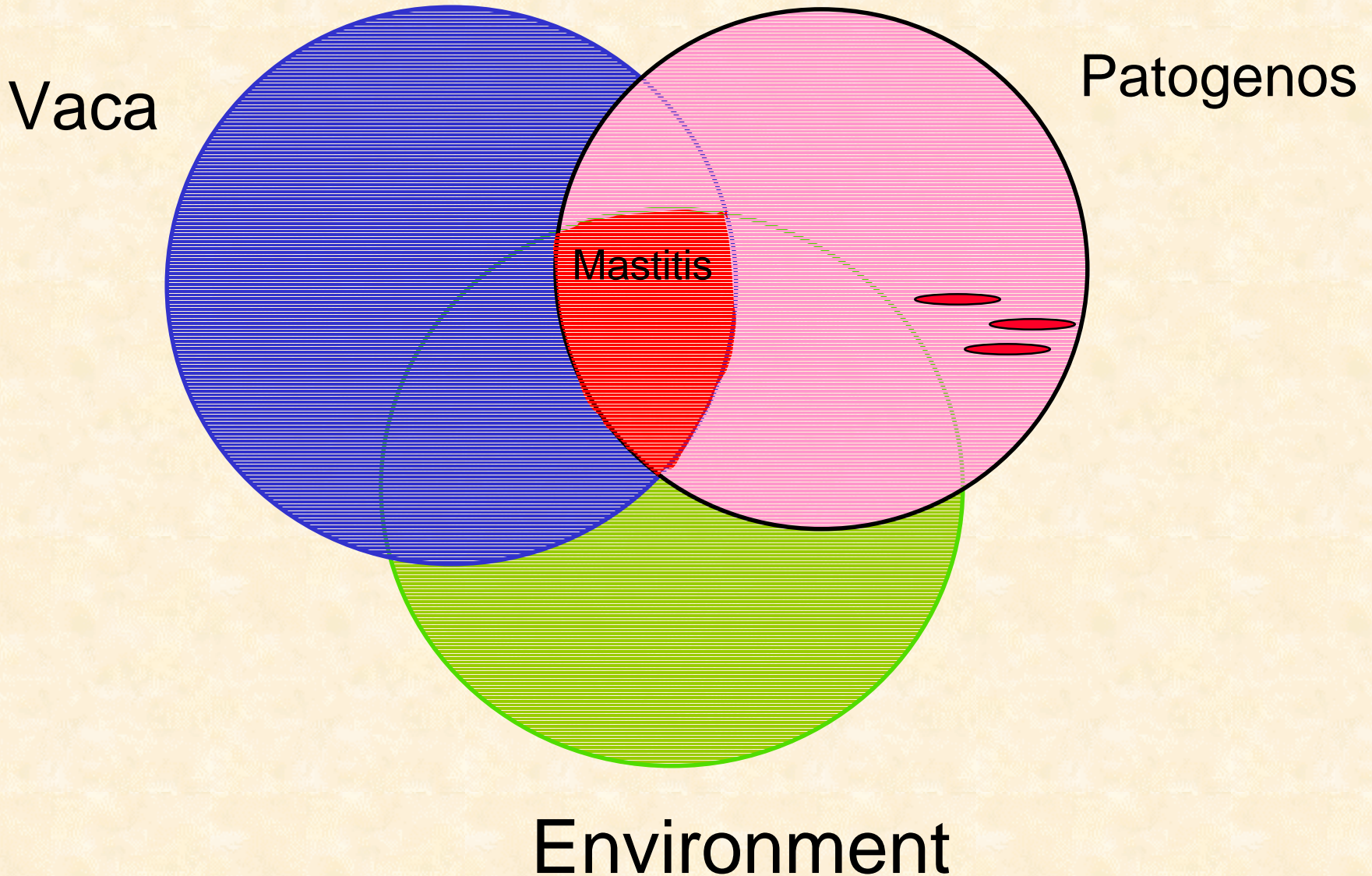


Example: *non-infectious disease*



Example: Mastitis

What are the factors?



Outcomes of Disease

- Subclinical disease

- lower milk production
- reduced product quality
- high culling rates
- high cost of production

- Clinical Disease

- lost milk production
- treatment cost
- high culling rates



***Greatest loss of
production and
profit***

Disease Prevention

Focus on things we can Control

- Uncontrollable risk factors
 - weather
 - presence of parasites or pathogenic bacteria
 - stage of lactation
- Risk factors that we don't *usually* want to control
 - high milk production
- Controllable risk factors
 - nutrition
 - cow handling
 - milking process
 - hygiene of cows and handlers
 - cow environment
 - exposure to infected or sick cows
 - Milking machine function
 - proper vaccination programs

Take Back to the Barn

- ➔ Diseases have multiple causes
- ➔ The presence of organisms doesn't mean that animals will get sick
- ➔ Management of the environment and cow are the most effective means of preventing disease
- ➔ Management needs to focus on things we can control to minimize the impact of disease

El Plan completed

- ✓ Define disease
 - ➔ clinical and subclinical
- ✓ Describe causes of disease in herds
 - ➔ cow, pathogen, environment
- ✓ How does disease affect productivity
 - ➔ undetected disease is costly
- ✓ Discuss disease prevention
 - ➔ prevention is most cost effective