



College of Veterinary Medicine and  
Animal Science, University of São Paulo

# Biosecurity in dairy herds

Presented by  
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Date:  
September 13, 2022



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Challenges

- BSM are implemented on a voluntary basis (not mandatory)
- BSM are infrequently especially in small and medium herds
- Low implementation related to the lack of knowledge on risks and biosecurity measures
- Low perception of the cost effectiveness of biosecurity measures
- There are some problems that need government helping



XANDÔ  
*Naci + sandavel!*

XANDÔ

XANDÔ

XANDÔ

Part 1:

# Contextualization

Biosecurity on the farm

Date:  
September 13, 2022

# Biosafety vs Biosecurity

Biosafety focuses on the person and what can be done to protect them from harm. This is often the term used for laboratory workers who handle infectious disease agents or the equipment such as needles, pipettes, and other;

Biosecurity focuses on the larger aspect – the farm or the veterinary hospital or the herd

by Danelle Bickett-Wedde

Definitions

## Biosecurity

Biosecurity has been defined as “a strategic and integrated approach to analysing and managing relevant risks to human, animal and plant life and health and associated risks for the environment”

by the World Health Organization and the Food and Agriculture Organization

# Objectives

## 01 - Animal Side

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↓ risk of infection ↓ morbidity  
↓ severity of diseases ↓ treatments  
↓ mortality  
↑ animal welfare  
↑ expression of its genetic potential  
↑ growth, development and performance



Biosecurity in the dairy farm

## 02 - Human Side

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↑ production of animal protein (milk and beef) to feed world population  
↑ Food safety and security  
↓ risk of zoonoses  
↓ antimicrobial resistance, drug residues



## 03 - Environmental Side

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↑ sustentability  
↑ productivity ↑ profitability  
↓ economic losses

↑ Global Marketing  
Brazilian livestock chain needs to attend the requirements imposed by large importing markets, and prevent restrictions related to sanitary barriers

↓ environment contamination





Part 2:

# Biosecurity Program

Biosecurity on-farm

Date:

September, 13, 2022



"More Healthy Milk Program" from Ministry of Agriculture, Livestock and Supply, allows participating agro-industries, dairy and milk cooperatives using presumed credits from PIS/Pasep and Cofins, from the purchase of fresh milk used as input for their dairy products, up to 50% of the amount to which they are entitled.

# Integrated Control Program of Bovine Viral Diarrhea Virus (BVDV)

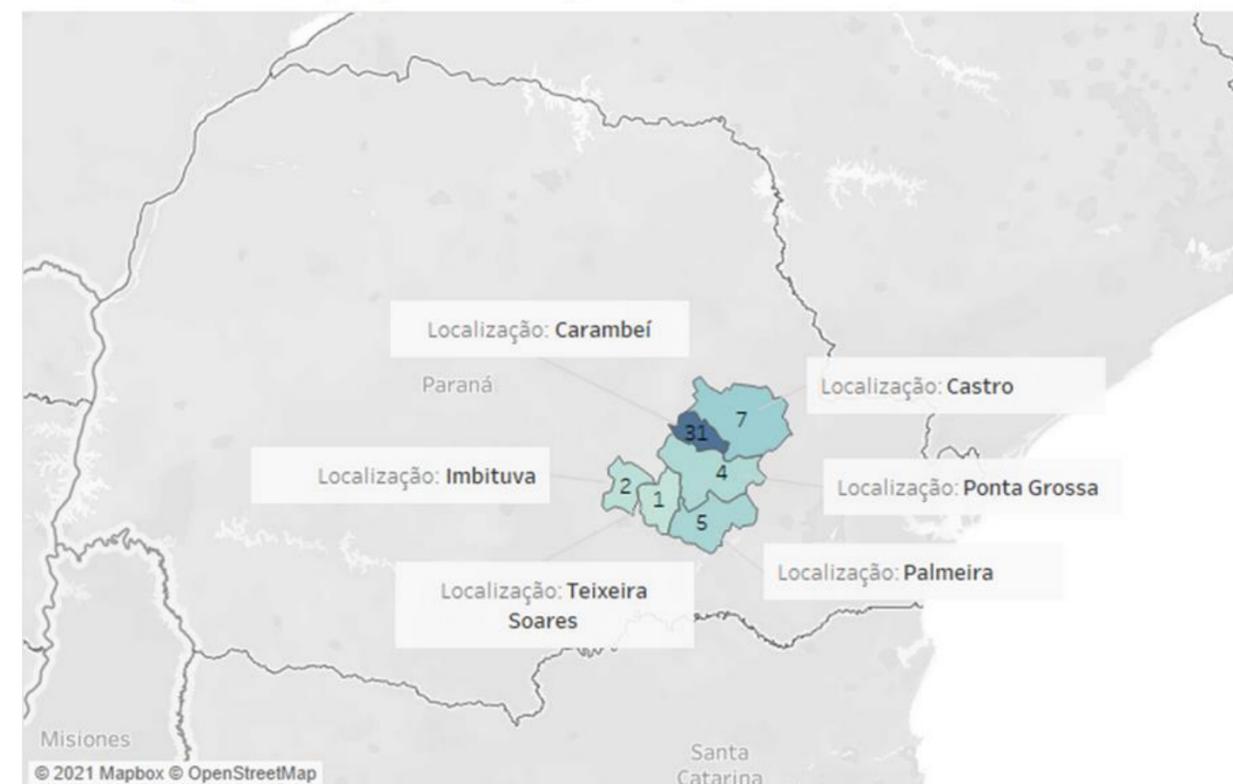
Castro and Carambeí are the leadership of milk production in Brazil  
Frísia Cooperativa Agroindustrial is the one of the largest dairy industry

Brazil, milk production = 35.4 billions of liters, R\$ 56,2 billions

Castro, milk production = 363,915 millions of liters, R\$ 651.4 millions (IBGE, 2020). Carambeí, milk production = 224,778 millions of liters, R\$ 402.4 millions (IBGE, 2020)

Farms characterization: average of 202 lactation dairy cows, 33 liters per day, SCC =  $210 \times 10^3$ /mL of milk, DIM = 194 days

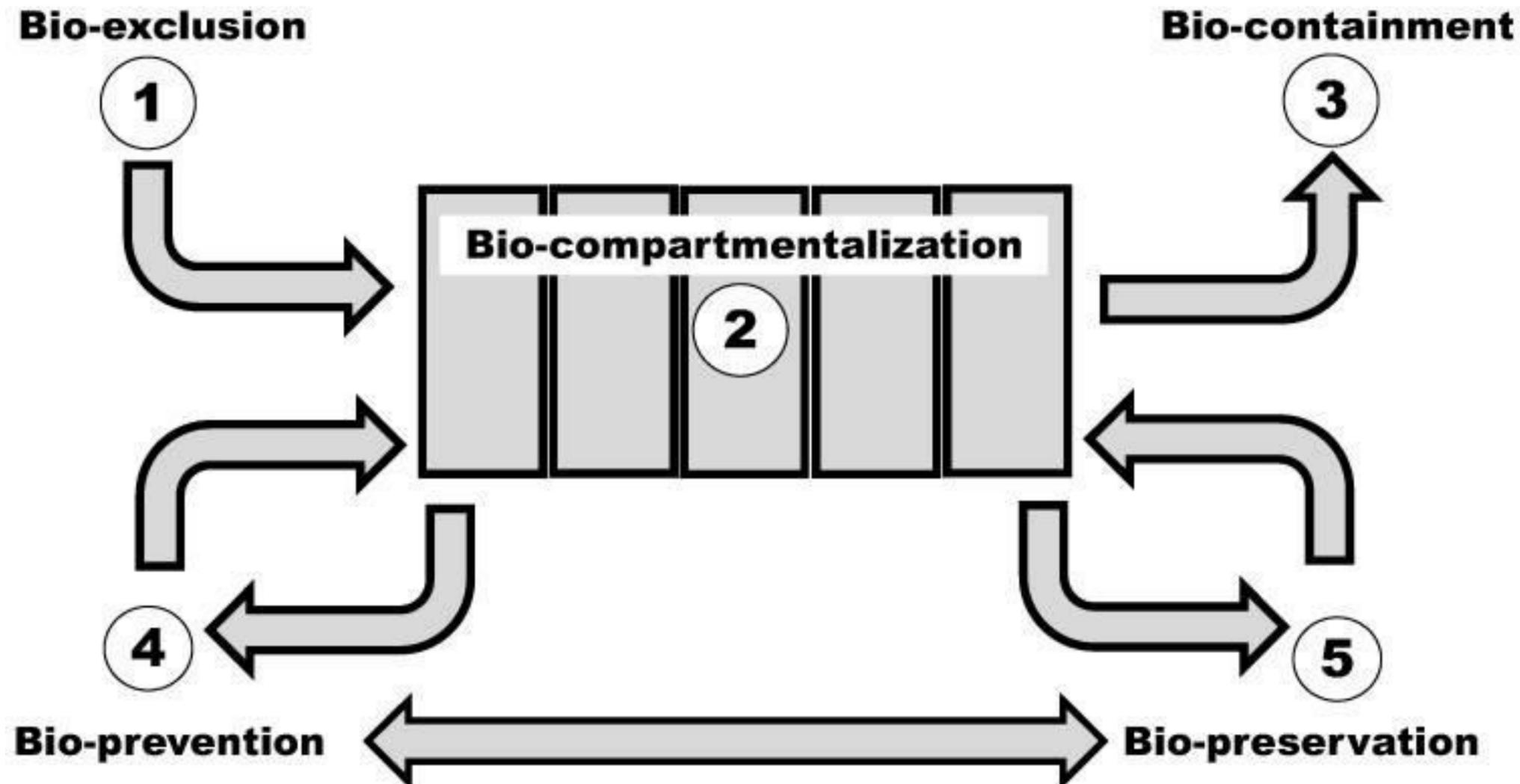
Sampling size = 68 dairy farms



Levels of the biosecurity in animal production in order to highlight its importance of animal health

## Biosecurity levels

(i) bio-exclusion, biosecurity measures (BSM) preventing the introduction of a pathogen at a farm, (ii) bio-compartmentalization, BSM preventing the spread of a pathogen within the farm, (iii) bio-containment, BSM preventing the spread of the pathogen to other farms or premises, (iv) bio-prevention, BSM preventing the spread of zoonotic pathogens to humans, and (v) bio-preservation, BSM preventing environmental contamination. Each BSM can be related to one or several biosecurity compartments



Source: Renault et al. Biosecurity at Cattle: Strengths, weakness, opportunities and threats, Pathogens, 10 (10):1315, Oct 2021.

# Biosecurity project

"Dairy Biological Risk Management (BRM)"

Method to assess an operation focus on disease prevention looking at ...

Source: Development and initial validation of a dairy biological risk management assessment tool  
by Danelle Bickett-Weddle  
Iowa State University, 2009

The Center for Food Security & Public Health, Iowa State University

Farm Biosecurity - CFSPH (iastate.edu)

Risk perception

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Risk Assessment (vulnerabilities)

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Risk Management (make decisions)

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Risk Communication



# 1. Risk Perception

Health Belief Model (HBM) was developed in the early of 1950s in order to understand the failure of people to adopt disease prevention strategies. There are 5 components of health-related behavior:

1. Perception of susceptibility (probability) and severity of diseases;
2. Perception benefits and effectiveness of various actions;
3. Perception of barriers (obstacles) to performing a recommended health practice;
4. Perception of the outcome achievement;
5. Self-efficacy, motivation and confidence.

Aspects influenced by different demographic and psychological variables.

Acesse pelo QrCode



## QUAL O NÍVEL DE BIOSSEGURIDADE DA SUA FAZENDA?

Biosseguridade é o conjunto de práticas de manejo que você faz para diminuir a carga microbiana do rebanho e incidência de doenças infecciosas.

Você sabe quais?

Preencha as informações para a

### ANÁLISE DE RISCO BIOLÓGICO

e descubra!

Ao final você terá seu resultado expresso no grau de risco e vulnerabilidades do rebanho aos agentes infecciosos.

Confira abaixo:



Apoie essa pesquisa!

## 2. Risk Assessment

### New Risk Management assessment available online

Look at the operation to evaluate the various strengths and weaknesses related to a disease entering and spreading



## 2. Risk Assessment

### Results from Paraná state

**Mediano**

257,35 / 500 pontos

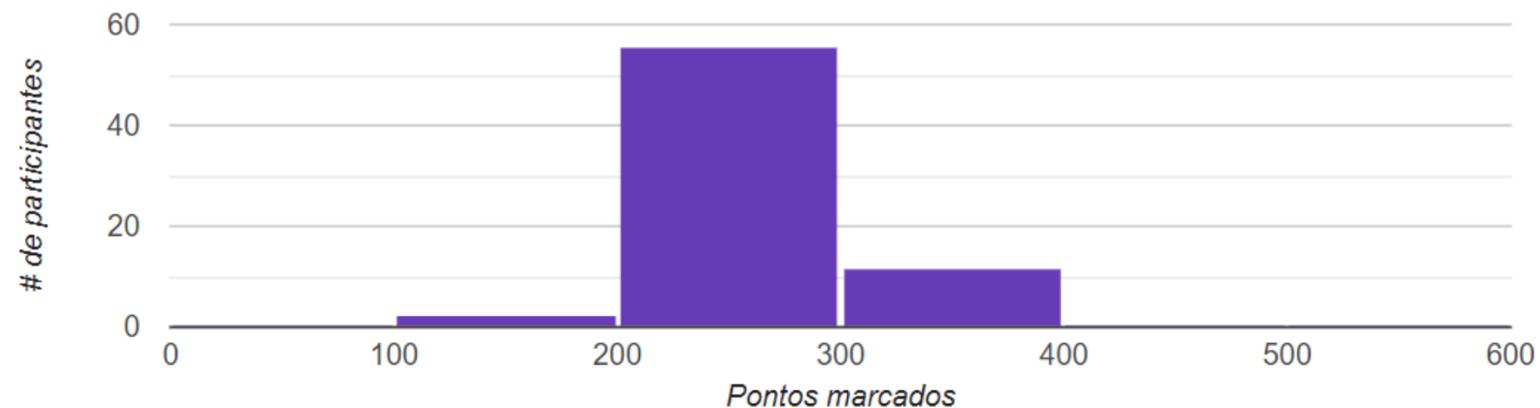
**Mediana**

250 / 500 pontos

**Intervalo**

190 - 330 pontos

Distribuição do total de pontos

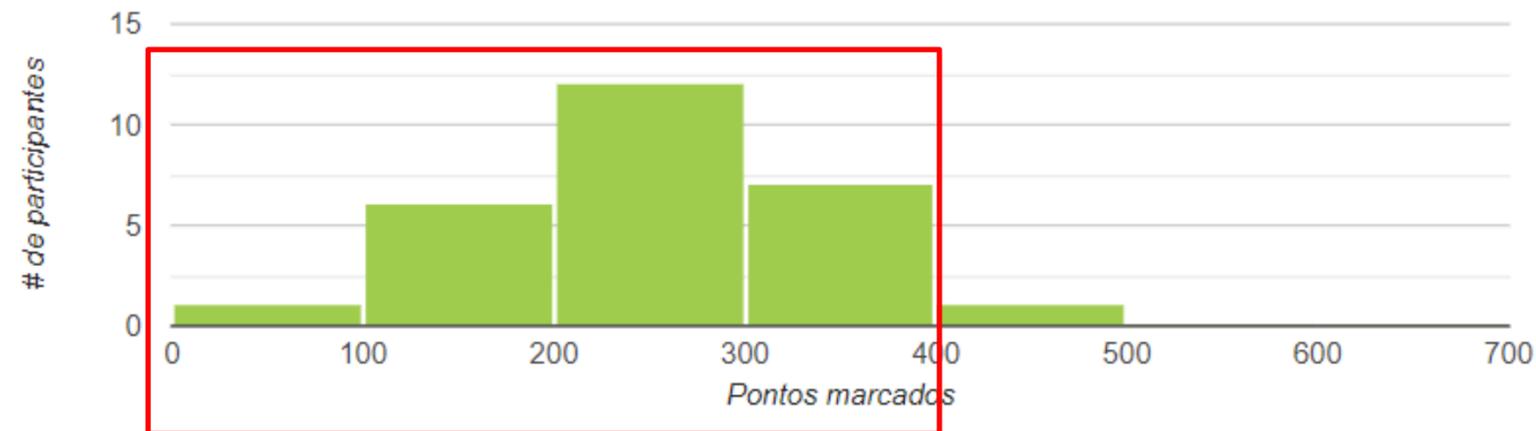


The pontuation of most farms is low, showing a high biological risk of introduction and spreading of diseases on the herd (n=68 dairy farms)

The correct answers from the questionnaire generates a total puntuaction, and this number represents the different levels of biological risks by farms

<b>Mediano</b> 255,04 / 562 pontos	<b>Mediana</b> 257 / 562 pontos	<b>Intervalo</b> 99 - 466 pontos
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Distribuição do total de pontos



n= 26 dairy farms for different brazilians states

Low risk

Medium low risk

Medium risk

Medium high risk

High risk

Extreme high risk

Pontuação máxima a ser obtida: 572 pontos

De 515 a 572 pontos - Baixo risco

De 458 a 514 pontos - Risco médio-baixo

De 430a 457 pontos - Risco médio

De 287 a 429 pontos - Risco médio-alto

De 144 a 286 pontos - Alto risco

De 0 a 143 pontos - Risco extremamente alto

## 2. Risk Assessment

### Partial results from other Brazilian states

The correct answers from the questionnaire generates a total puntuaction, and this number represents the different levels of biological risks by farms



## Management of Biological Risks

MANUAL DE BIOSSEGURIDADE  
EM SISTEMA DE

# PRODUÇÃO LEITEIROS

PARCERIA FMVZ/USP E FRÍSIA  
COOPERATIVA AGROINDUSTRIAL



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## 4. Risk Communication

Communication is key!

Once risks are identified and a plan is developed, it must be understood and supported to be effective



Part 3:

# Biosecurity Challenges

Biosecurity on-farm

Date:

September, 13, 2022

# Challenges on the implementation level of biosecurity measures in cattle farms

Main findings of different studies related to the implementation level of biosecurity measures in cattle farms.

## Challenge# 1

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BSM are poorly implemented as a voluntary program. Should it be mandatory?

## Challenge# 2

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Implementation mainly influenced by cost, and unproven efficacy

## Challenge# 3

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Low perception of the disease risk

## Challenge# 4

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Low implementation related to the lack of knowledge on risks and biosecurity measures, especially in small and medium herds

## Challenge# 5

Most farmers perceived their on-farm biosecurity as 'sufficient'. The farmers were satisfied with their on-farm biosecurity even though the biosecurity level was not particularly high

# Thanks

University of São Paulo

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Frísia Cooperativa Agroindustrial

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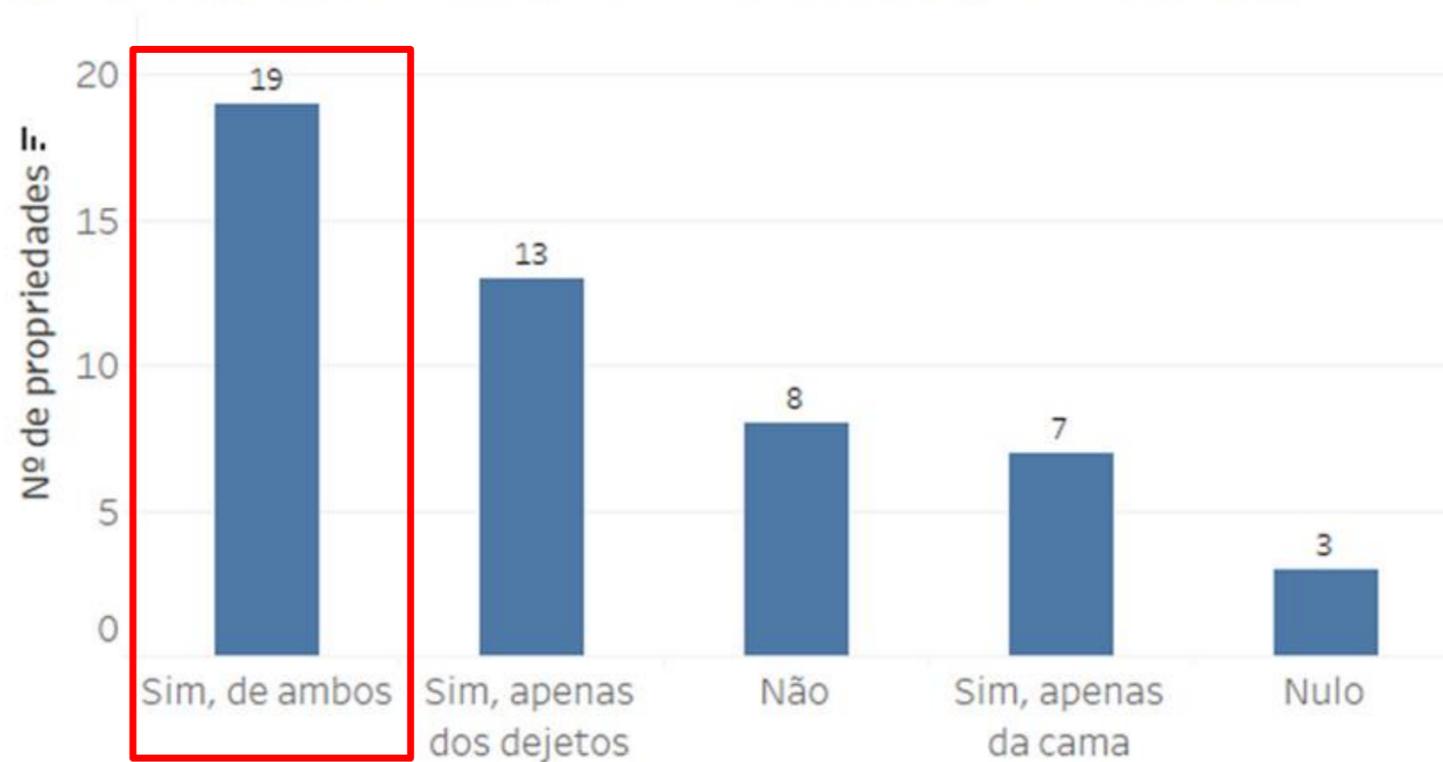
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# Risk Assessment

Environmental Concern

## Manure and contaminated bedding Management



Yes (for both), 19/50, 38%

Yes (only manure), 13/50, 26%

Yes (only bedding), 7/50, 14%

No (for both), 16%

## Carcass Disposal

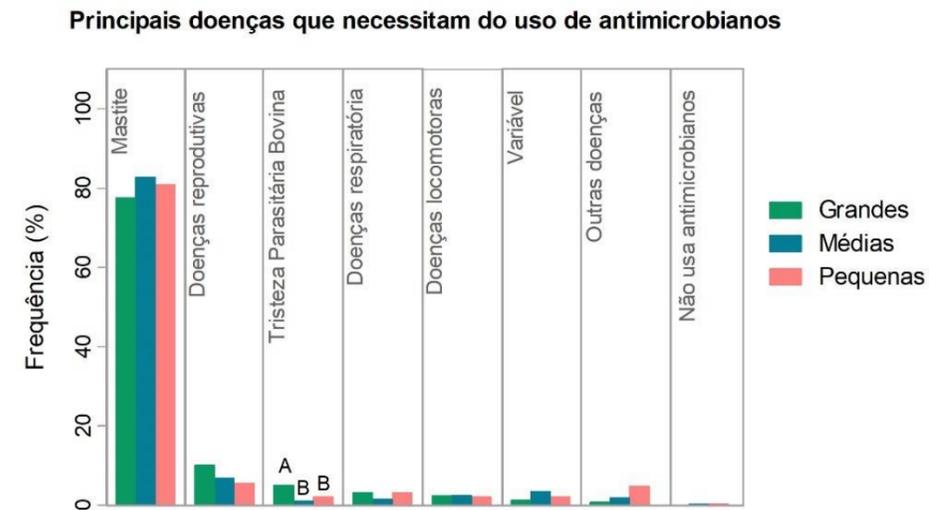


Most producers bury the carcass. However, some producers (19/50, 38%) answered that they discard the carcass far away from the property, in the field, ditches, paddocks and etc

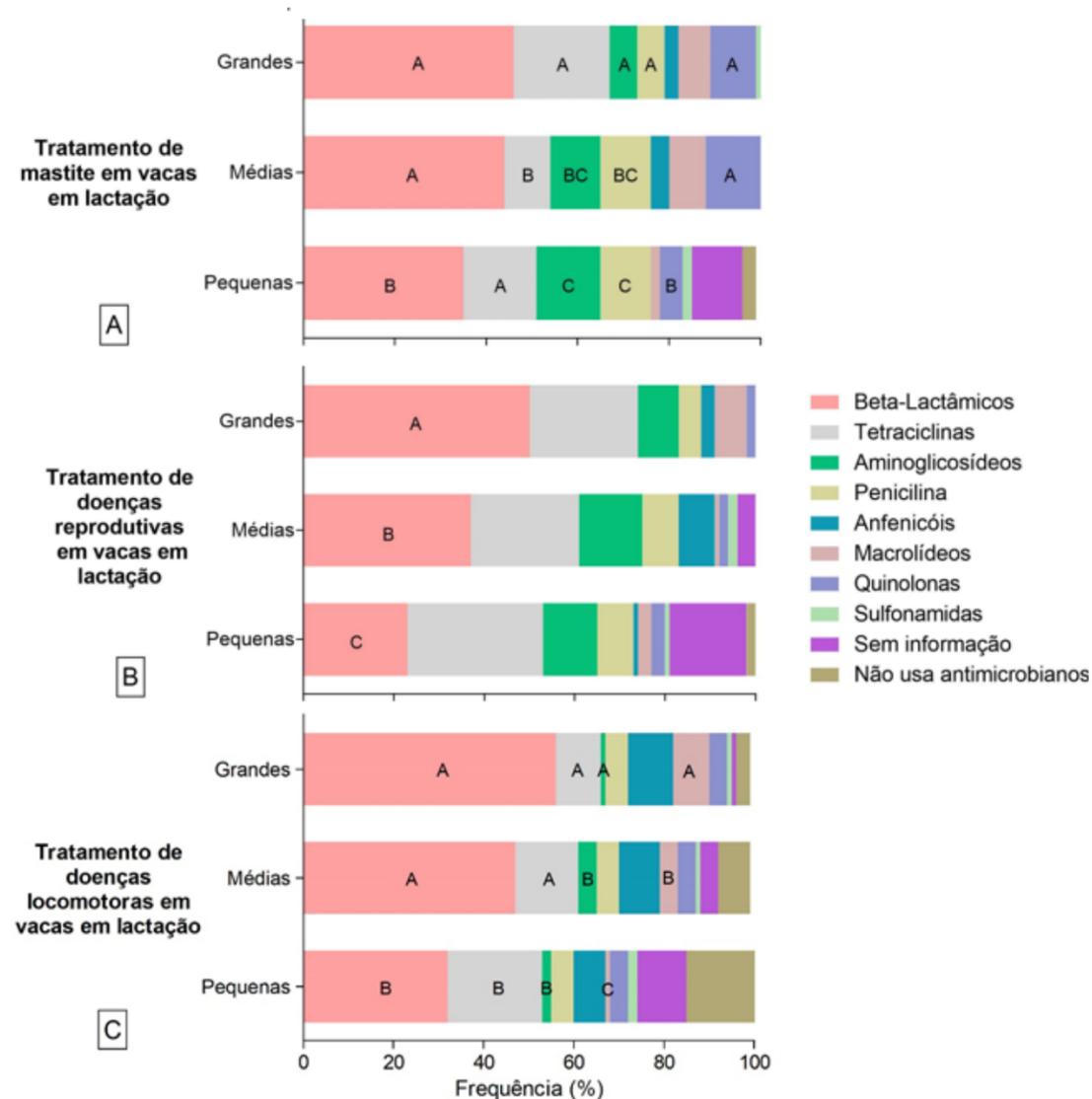
# Risk Assessment

## Environmental Concern

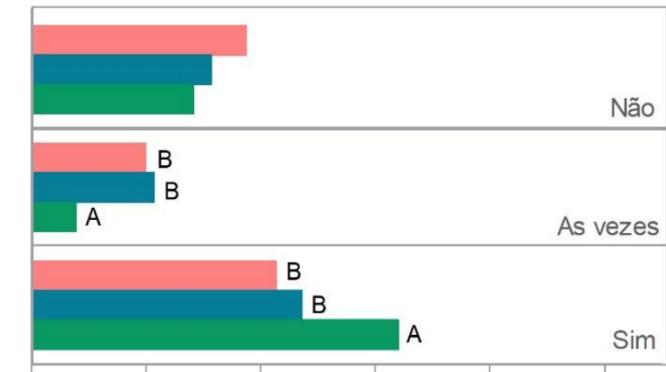
The mastitis is the main motivation to the antimicrobial use, especially drugs from beta lactams group. Unfortunately, the waste milk have been used to fed calves: 62.5% in small herds, 68.66% in medium herds and 71.71% in large herds (total of 1034 properties)



Herds were classified in small ( $\leq 20$ ), medium (21 to 70) and large ( $> 70$ ), according to the number of lactation cows



### Uso de leite de descarte



Martin et al (PhD Thesis)