American® Nutrients

SOLUTION IS OUR COMMITMENT

Dr. Daiane Carvalho – Research and Development
Angélica Niero – International Sales

CANADIAN BISON ASSOCIATION
ASSOCIATION CANADIENNE DU BISON

American® Nutrients

SOLUTION IS OUR COMMITMENT

Access the Electronic Form

BRAZIL IN THE WORLD OF AGRIBUSINESS

KNOW OUR NUMBERS...

1st
Producer and exporter of coffee and sugar

4th
Grain producer

2nd
Grain exporter

We are the 3rd largest agricultural exporter in the world...

2nd
Livestock Herd

1st
Export of beef and chicken

4th
Swine producer and exporter

Source: Ministry of Agriculture and Livestock of Brazil (2023)

>90%

Of the electric energy generated and used by brazilians and the agribusiness sector is produced from renewable sources:

HYDRAULIC, WIND, BIOMASS AND SOLAR

Source: Ministry of Mines and Energy of Brazil (2023)

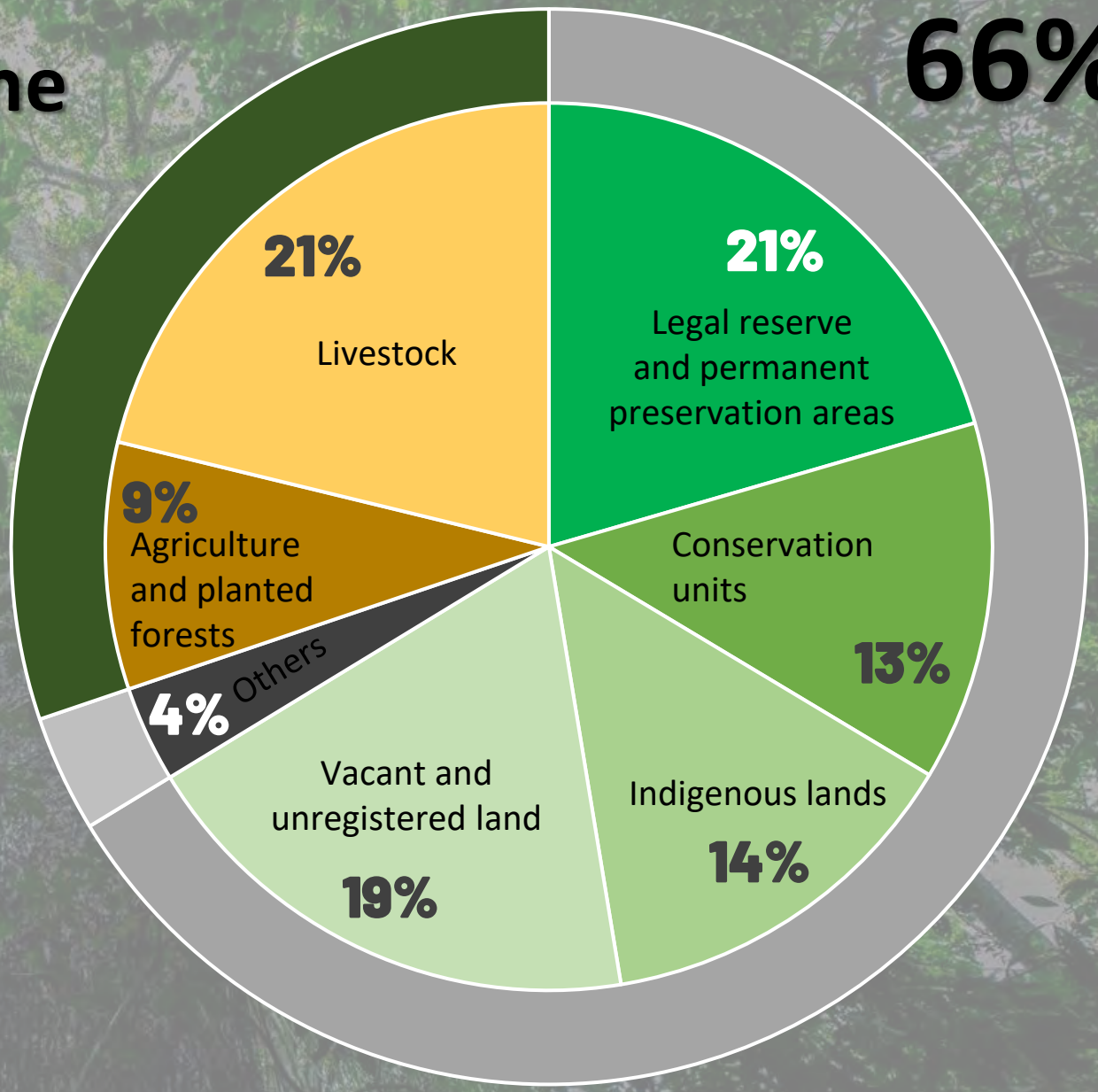
ACTIONS IN SUSTENTABILITY IN THE AGROBUSINESS IN BRAZIL

- Leader in the use of biologicals products in agriculture.
- Crop-livestock- native forest integration (animal welfare)
- Direct planting and slow release fertilizers.
- High productivity and protection of forests.
- Federal programs that aim to make agricultural production in Brazil increasingly sustainable (ABC+ Program).
- Total areas allocated to native vegetation is 66.3%

Source: Embrapa (2022); Ministry of Agriculture and Livestock of Brazil (2023)

30% linked to the agribusiness sector

Brazilian environmental legislation is considered one of the most complete and advanced in the world.



Source: Embrapa Satellite Monitoring, with data from IBGE, CNA, MMA, FUNAI, DNIT, ANA, MPOG.

Vitamin Mineral Supplement with Yeast Culture and Poliphenols Reduces Enteric Methane Emission in Cattle

AMERICAN CATTLE

Topics

- Contextualize the problem of global warming with some numbers;
- The American Cattle supplement;
- Studies to validate the product to reduce methane emissions;
- Field studies on farms in Brazil;
- Final considerations.

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In 2023 the average temperature of the earth

+1.4°C (34,52°F)

in relation to the pre-industrial average between 1850 and 1900

Source: Copernicus Climate Change Service (C3S) (2023)

The concentration of CO_2 in the atmosphere broke a record in 2023 with

424 ppm

Source: National Oceanic & Atmospheric Administration (NOAA) (2023)

The month of September 2023 broke air temperature records with

16,38°C (61,484°F)

above the monthly average between 1991-2020

Source: Copernicus Climate Change Service (C3S) (2023)

GLOBAL WARMING

And about Methane....

Methane (CH_4) is **28x** more polluting than CO_2

It takes **12 years** to decompose

41% of global emissions are related to beef cattle

Methane production represents a **loss of up to 18% of the total** energy consumed, causing a drop in zootechnical performance

Source: Baceninaitè et al. (2022); FAO (2023); SEEG (2023)

Greenhouses Emissions in Canada

1

Between **1990 - 2021**, the amount of GHGs emitted per person **decreased 17%** from 21.3 to 17.5 tonnes of carbon dioxide equivalent (CO_2 eq) **per person**

2

10% of Canada's greenhouse gas emissions are from **crop and livestock production**

3

The GHG footprint of **Canadian beef production 11.04 kg CO_2 equivalent**, representing **2.4% of Canada's overall emissions**, less than half the world average

4

Under controlled conditions the **bison's methane emission** is 30 kg/year (eq. **690 kg CO_2**)

Source: Governement of Canada (2023); Canadian Cattle Association (2023)

AMERICAN CATTLE

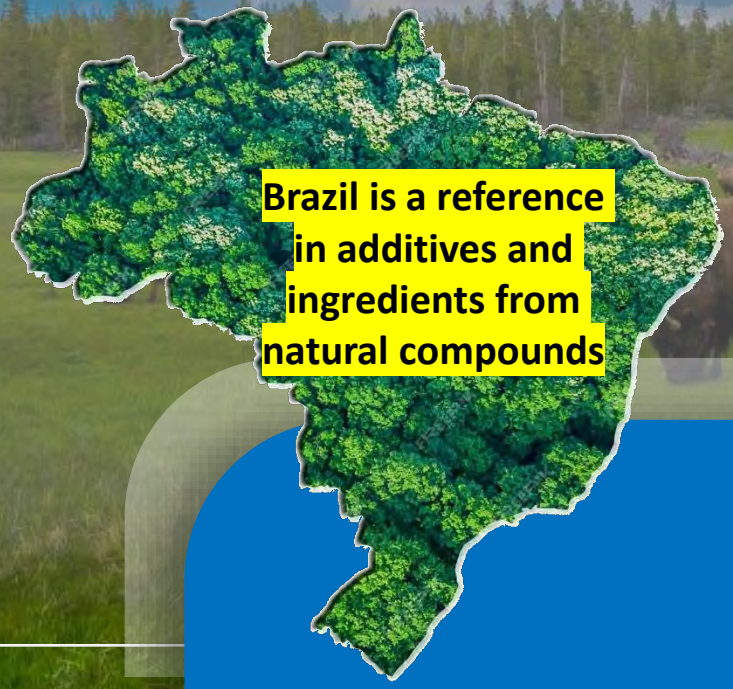
MINERAL AND VITAMIN SUPPLEMENT WITH YEAST CULTURE AND POLYPHENOLS

ANIMAL WELFARE

BOVINOS GANADO CATTLE
BIENESTAR ANIMAL AMIGABLE
AMIGA DO BEM-ESTAR ANIMAL
ANIMAL WELFARE FRIENDLY
CERTIFICATE

AMERICAN CATTLE

American Cattle is produced from natural ingredients, contributing to animal, human and environmental health



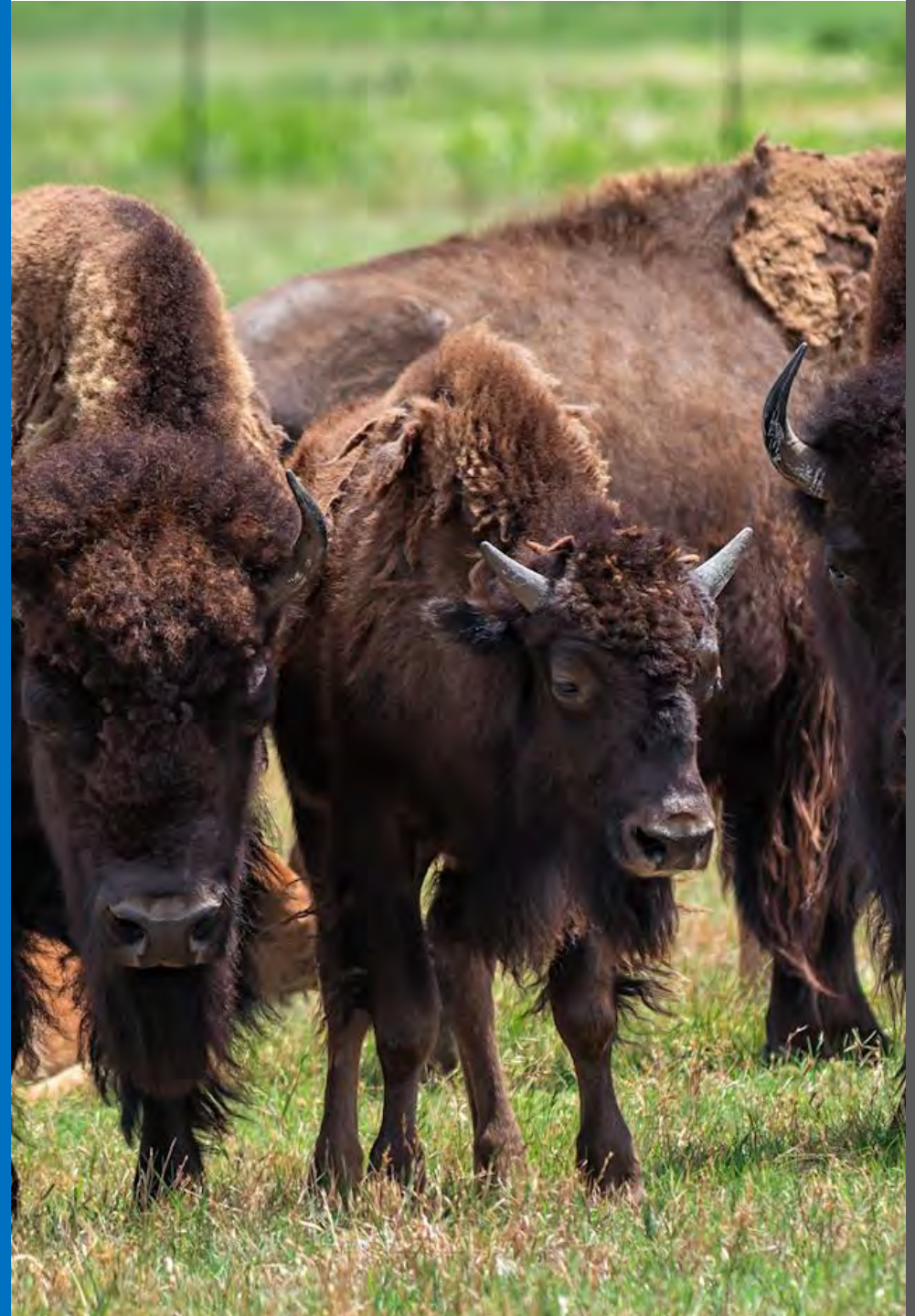
Brazil is a reference in additives and ingredients from natural compounds

ONE HEALTH

RECOMMENDATION

50 – 100 grams/animal/day

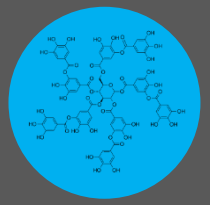
Beef Cattle with sanitary challenge:
Double dosage recommended



Measuring spoon allows you to divide the dose into 2 daily doses.

Understanding the Composition...

POLIPHENOLS



- Provides by pass protein;
- Antimicrobial, Anti-inflammatory and Antioxidant effect;
- Modulation of ruminal fermentation with suppression of rumen methanogenesis.

YEAST CULTURE AND AUTOLYZED YEAST

- Nucleotide source and high biological value protein;
- High palatability;
- Modulation of ruminal fermentation with suppression of rumen methanogenesis.

The association between polyphenols and yeast compounds acts to reduce methane gas emissions

Understanding the Composition...

MANNANOLIGOSARIDES AND BETA-GLUCANS

- Immunomodulator;
- Agglutinatination pathogens;
- Helps control mycotoxins.

MYCOTOXIN ADSORBENT

- High affinity for aflatoxins;
- Reduces the excretion of Aflatoxin M1 in milk.

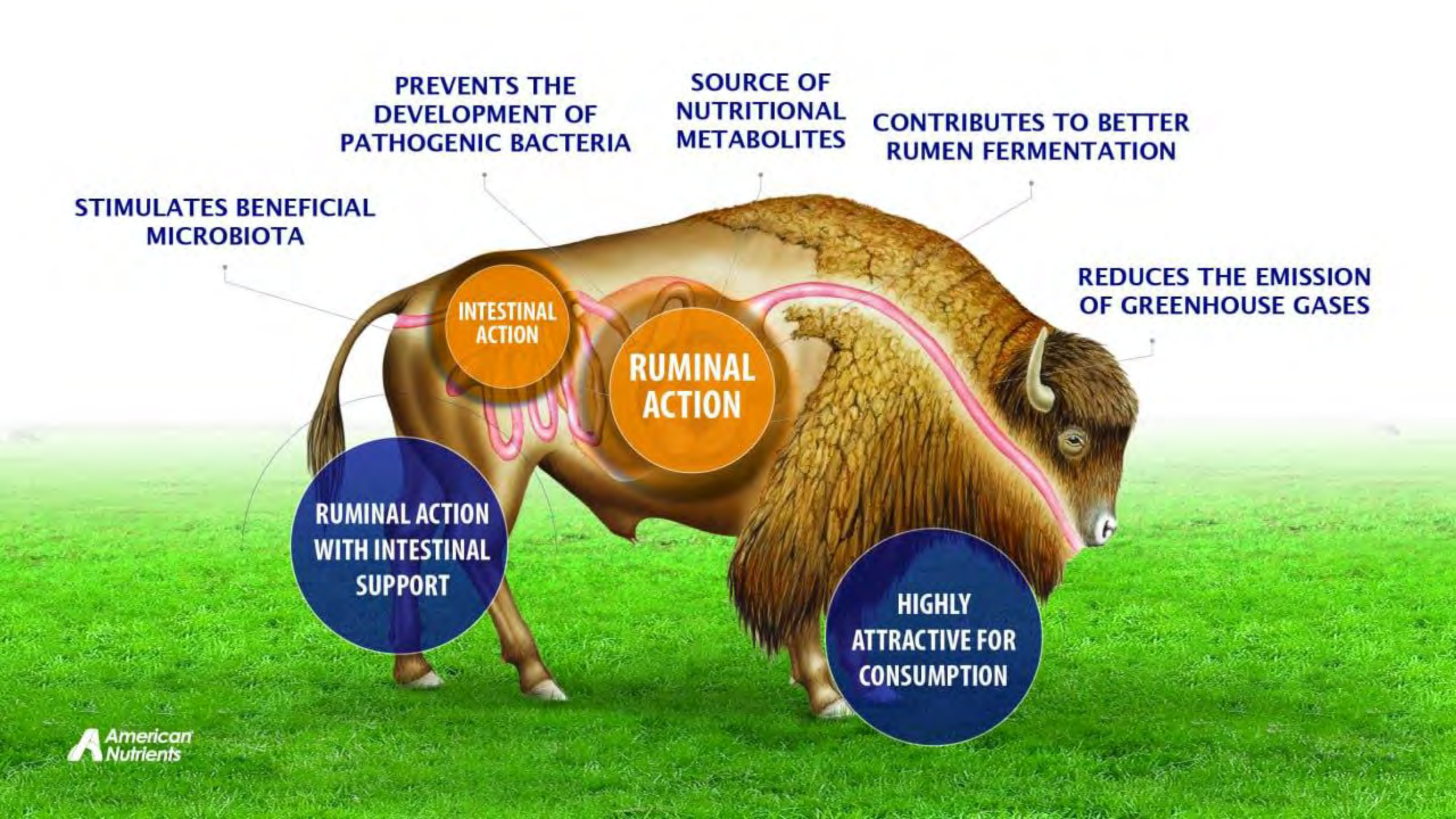
Understanding the Composition...

VITAMINS A,D,E

- Microencapsulated and high stability;
- Related to immunity, reproduction, skin integrity and calcium metabolism.

SELENIUM AND ZINC

- Related to the carbohydrates, lipids and proteins metabolism;
- Important for immunity.


PREVENTS THE DEVELOPMENT OF PATHOGENIC BACTERIA
SOURCE OF NUTRITIONAL METABOLITES
CONTRIBUTES TO BETTER RUMEN FERMENTATION
STIMULATES BENEFICIAL MICROBIOTA
REDUCES THE EMISSION OF GREENHOUSE GASES
INTESTINAL ACTION
RUMINAL ACTION
RUMINAL ACTION WITH INTESTINAL SUPPORT
HIGHLY ATTRACTIVE FOR CONSUMPTION
American Nutrients

BENEFITS IN ONE HEALTH

FOR THE PRODUCER

- Greater productivity;
- Greater Profitability;
- Natural growth promoter;
- Sustainable production;
- Weight gain.

BENEFITS IN ONE HEALTH

FOR THE ANIMAL

- Ruminal and intestinal action;
- Greater animal welfare;
- Liver protection;
- Greater immunity;
- Reduces the negative impacts of thermal stress.

BENEFITS IN ONE HEALTH

FOR THE ENVIRONMENT

- Proven reduction in methane gas emissions;
- AGP free.

BENEFITS IN ONE HEALTH

FOR THE CONSUMER

- Guarantee of safe food;
- More quality and antibiotic free.

RESEARCH

Scientific Studies

AMERICAN CATTLE

Validation for reducing methane gas emissions

Efficiency studies of American Cattle in Brazil

STATUS
Study 1 – Concluded
Study 2 – In progress
Study 3 – Concluded

UFV
Universidade Federal de Viçosa

2 - In vivo evaluation:
Methane emissions and milk quality in dairy cows

Universidade Federal de Santa Maria
1960

GEAPA
GRUPO DE ESTUDO EM ADITIVOS NA PRODUÇÃO ANIMAL
UFSM

1 - In vitro evaluation:
Methane emissions

American Nutrients + INSTITUTO SENAI DE TECNOLOGIA COURO E MEIO AMBIENTE

3 - Life cycle evaluation

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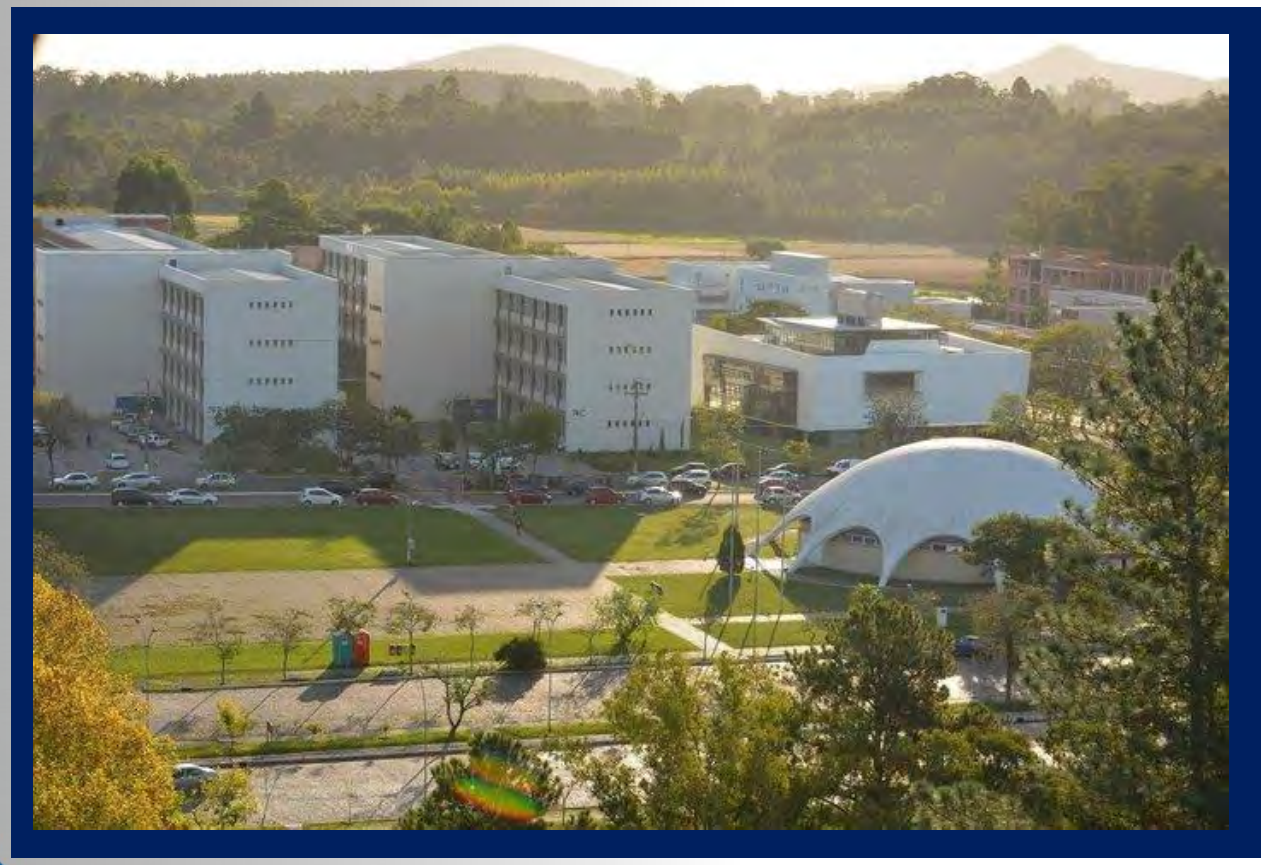
IN VITRO

Universidade Federal de Santa Maria
SEDES SAPIENTIÆ
1960

Reduction of methane gas emissions - *In vitro*

Research location: **Federal University of Santa Maria**

Sector: **Study group on additives in animal production**



Universidade Federal de Santa Maria
SEDES SAPIENTIÆ
1960

GEAPA
GRUPO DE ESTUDO EM ADITIVOS NA PRODUÇÃO ANIMAL
UFSM

Reference University in Southern Brazil in studies with ruminants and in vitro digestibility simulations.

Material and Methods

EXPERIMENTAL DESIGN

Tratament 1	Negative Control (No Additives)
Tratament 2	Positive Control (monensin equiv. 350 mg/cow/day)
Tratament 3	AMERICAN CATTLE (equiv. 50 g/cow/day)

Monensin sodium is one of the ionophores most used as a performance enhancer in cattle production.

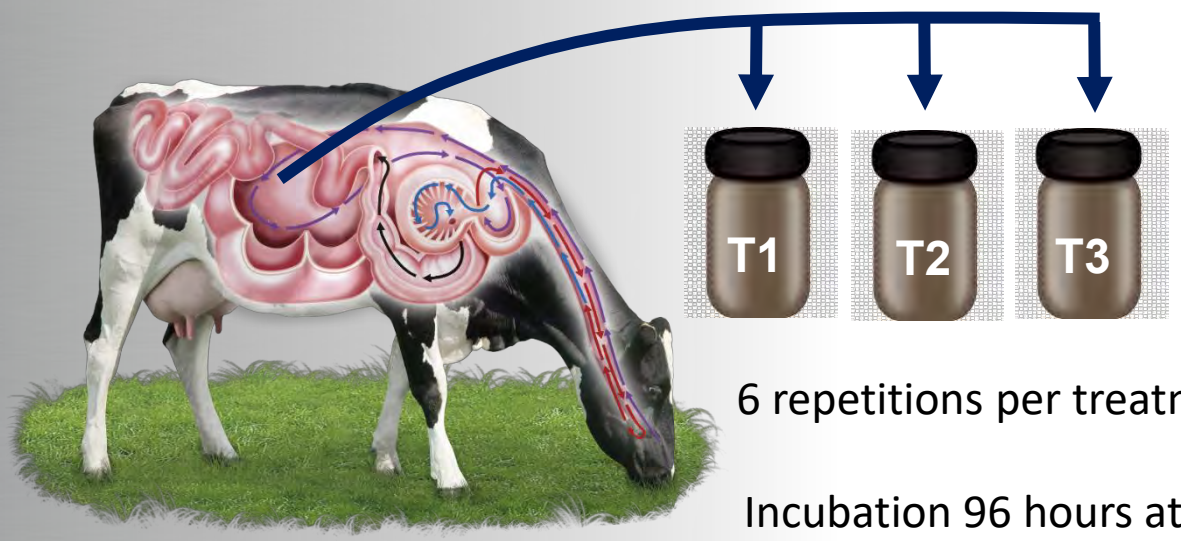
AMERICAN CATTLE

Material and methods

In vitro rumen fermentation technique

(THEODOROU et al., 1994)

CEUA-UFSM - 5439180417



(60 roughage : 40 concentrate)

6 repetitions per treatment

Incubation 96 hours at 39°C

Methane quantification:

6h, 12h, 24h, 30h e 96h

Quantification of SCFA:

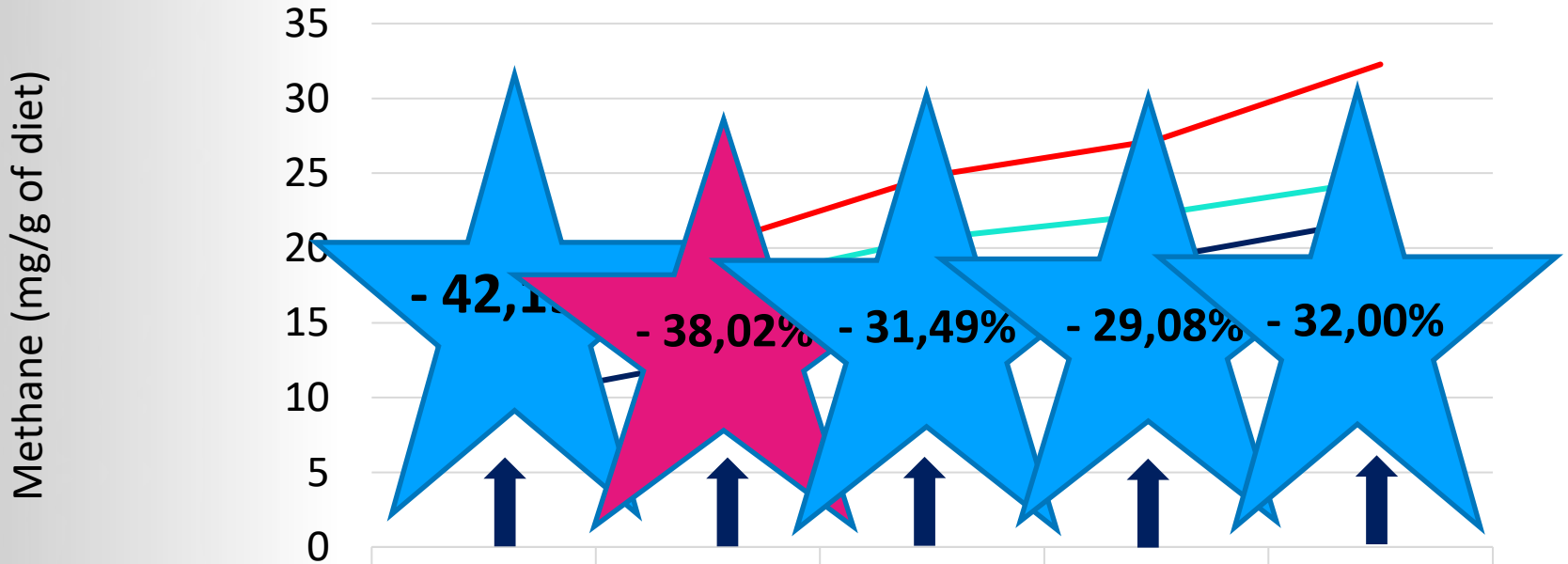
Acetic Acid and Propionic Acid
24 hours

Chromatographic analysis
(MOTERLE et al., 2013)

Statistical analysis:
Tukey at 5% significance

Results

Methane production (mg/g of diet) over 96 hours using the in vitro ruminal fermentation kinetic technique of diets containing or not American Cattle or monensin.



	6 Hours	12 Hours	24 Hours	30 Hours	96 Hours
Control	16.71 a	20.12 a	24.83 a	27.2 a	32.28 a
Monensin	14.5 a	17.45 ab	20.66 ab	22.27 ab	24.54 b
American Cattle	9.66 b	12.47 b	17.01 b	19.29 b	21.95 c

Means with different lowercase letters in the line differ from each other using the Tukey test ($p<0.05$).

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Results

Table 1 - Concentration (mmol/L) of acetic and propionic acid and its ratio after 24 hours of incubation using the *in vitro* ruminal fermentation kinetic technique of diets (60 roughage: 40 concentrate) containing, or no, sodium monensin or American Cattle.

	Control	Monensin	American Cattle	SD	p value
Acetic Acid	56,38^{ab}	59,63 ^{a}	50,10^{c}	2,1	0,001
Propionic Acid	18,83^{a}	26,89^{b}	20,10^{c}	0,978	0,001
Relation A:P	3,00^{a}	2,20^{b}	2,49^{c}	0,093	0,001

Means with different lowercase letters in the line differ from each other using the Tukey test ($p<0.05$).
SD: Standard deviation

It was observed that treatment with Monensin had a lower A:P ratio compared to American Cattle.

However, American Cattle had a greater reduction in methane emissions, indicating that the product acts in other ways to reduce enteric emissions of this gas.

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Award-Winning Work at the 34th Annual Metting of Brazilian Animal Nutrition Association

34ª Reunião Anual do CBNA - 2023

COLÉGIO BRASILEIRO DE NUTRIÇÃO ANIMAL
cbna

CERTIFICADO

Conferido a **DAIANE CARVALHO**

O **Prêmio CBNA de Pesquisa** pelo mérito de melhor trabalho científico apresentado na 34ª Reunião Anual do CBNA "A NUTRIÇÃO ANIMAL E AS DEMANDAS DO CONSUMIDOR: BEM-ESTAR ANIMAL E MEIO AMBIENTE" (ÁREA BOVINOS), promovido pelo Colégio Brasileiro de Nutrição Animal, no período de 21 a 23 de março de 2023, no Hotel Premium, em Campinas, SP, sob o título "POTENCIAL DE REDUÇÃO DE METANO E AVALIAÇÃO DO PERFIL DE ÁCIDOS GRAXOS DE CADEIA CURTA DE UM SUPLEMENTO NATURAL A BASE DE COMPOSTOS DE LEVEDURA DE SACCAROMYCES CEREVISIAE E POLIFENÓIS UTILIZANDO A TÉCN", tendo como coautores LUIZA M. SEVERO, LUANA SPECHT, MICHELE FANGMEIER, CLAUS A. KETTERMANN, RODRIGO ZAMBON

Campinas, 23 de março de 2023

Godofredo Miltenburg
Presidente

Alltech · ADISSEO A Bluestar Company · Sindirações · DSM · KEMIN · APC · Elanco · Aj AJINOMOTO · TECNOGLOBO · AbVista

AMERICAN CATTLE

Our *IN VIVO* Experience with Dairy Cows

UFV
Universidade Federal de Viçosa

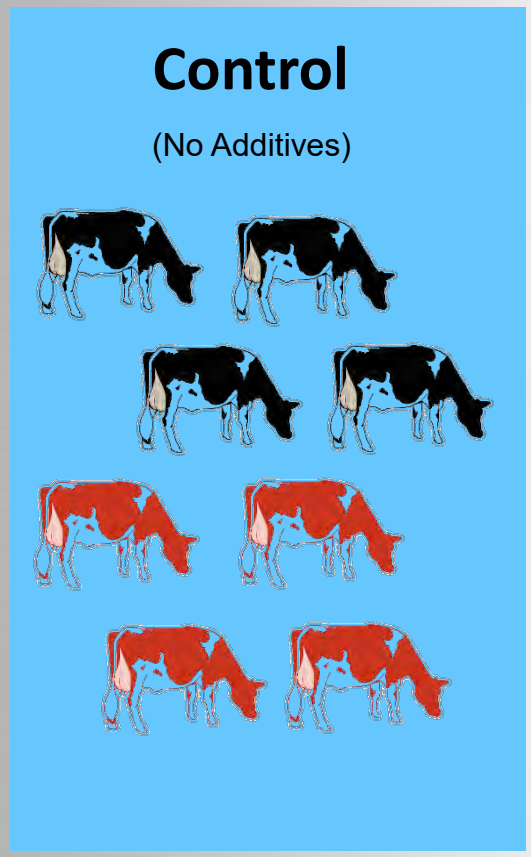
Methane gas emission and milk quality *In vivo*

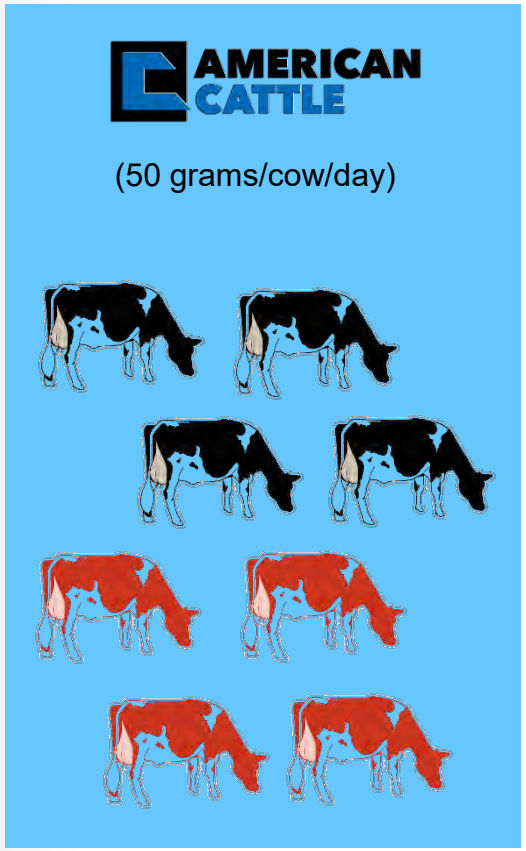
Research location: **Federal University of Viçosa (the region is a reference in dairy production in Brazil)**

Zootechnics Department

AMERICAN CATTLE

Experimental Desing





- 16 lactating cows (8 crossbred Holstein + Gir animals and 8 Holstein animals)
- Randomized block design formed according to Days in lactation (DL)
- The experimental period was 90 days with 22 days for adaptation.
- Diet: corn silage and concentrate for the nutritional requirements for a milk production of approximately 30 kg/day.

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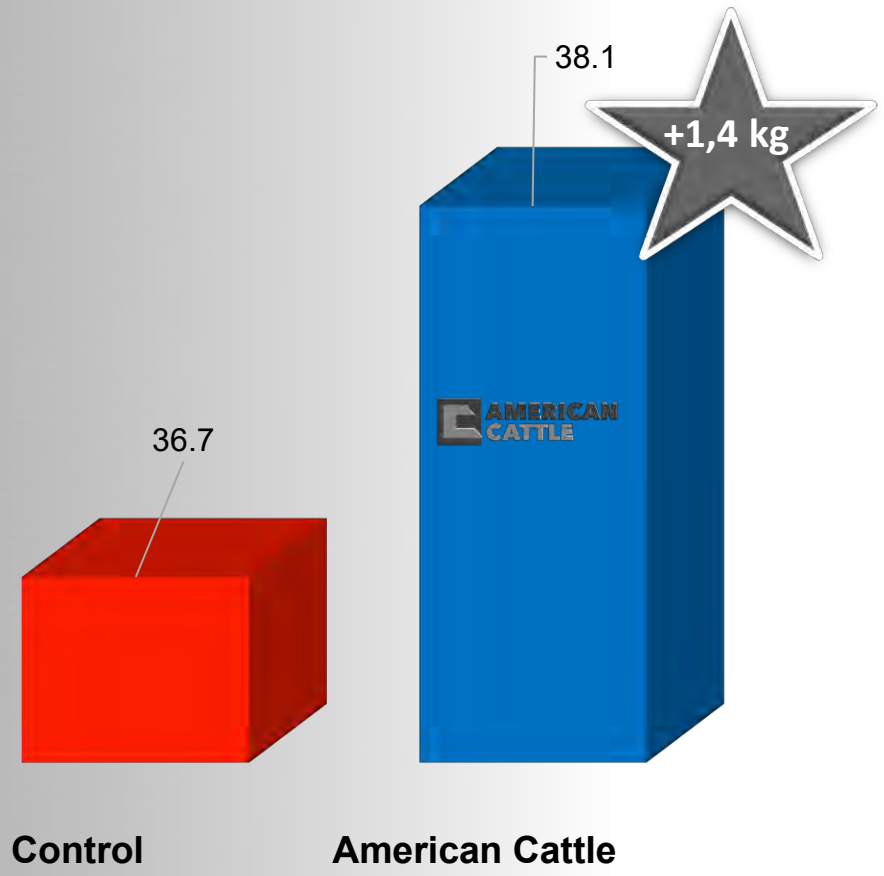
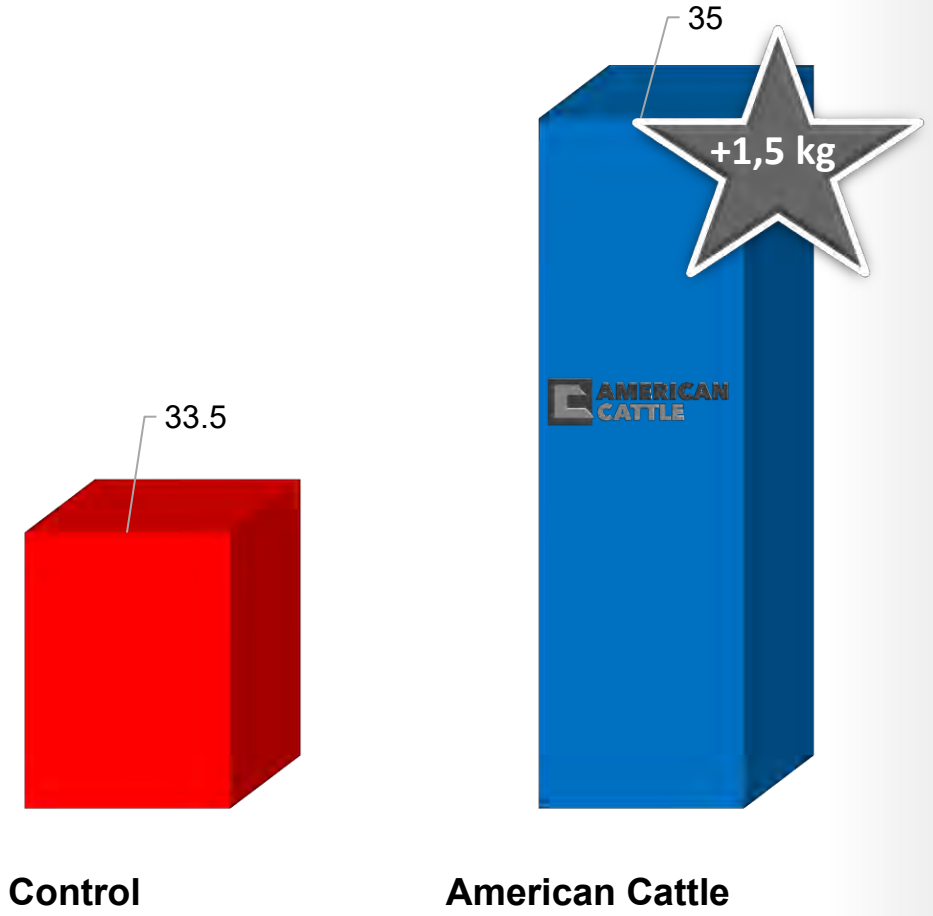
Parcial Results – Milk Production

Milk Production (kg/cow/day)

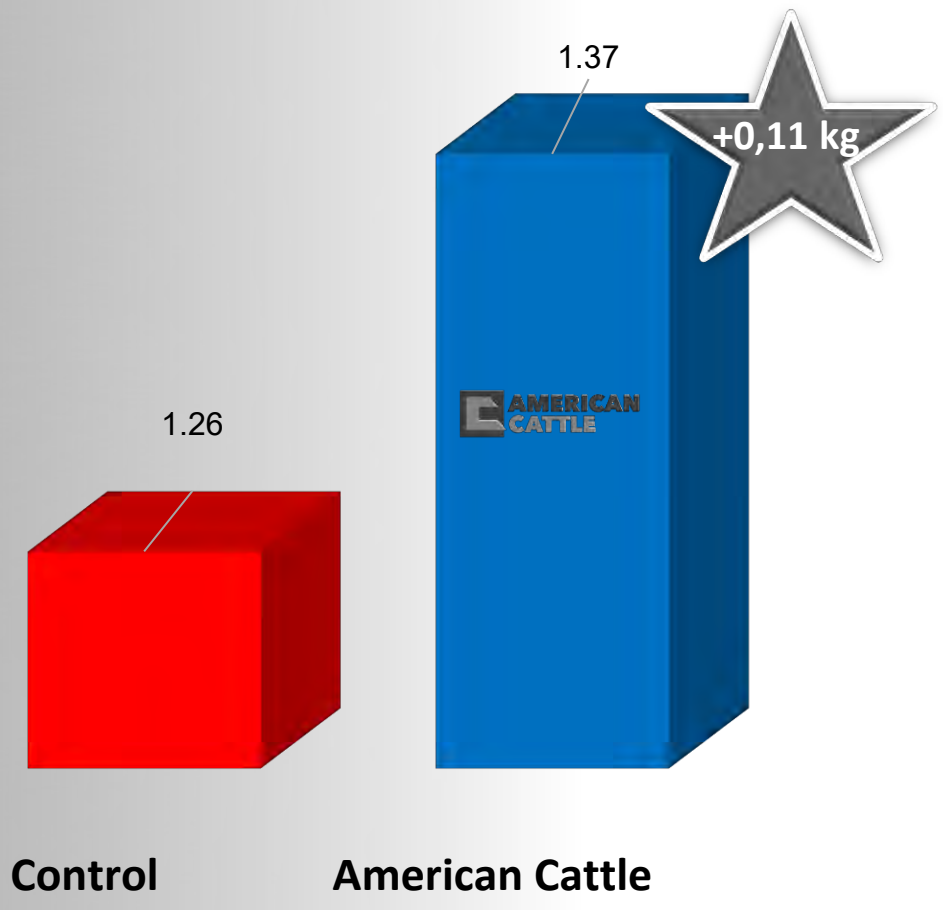


Energy-corrected milk production (kg/cow/day)

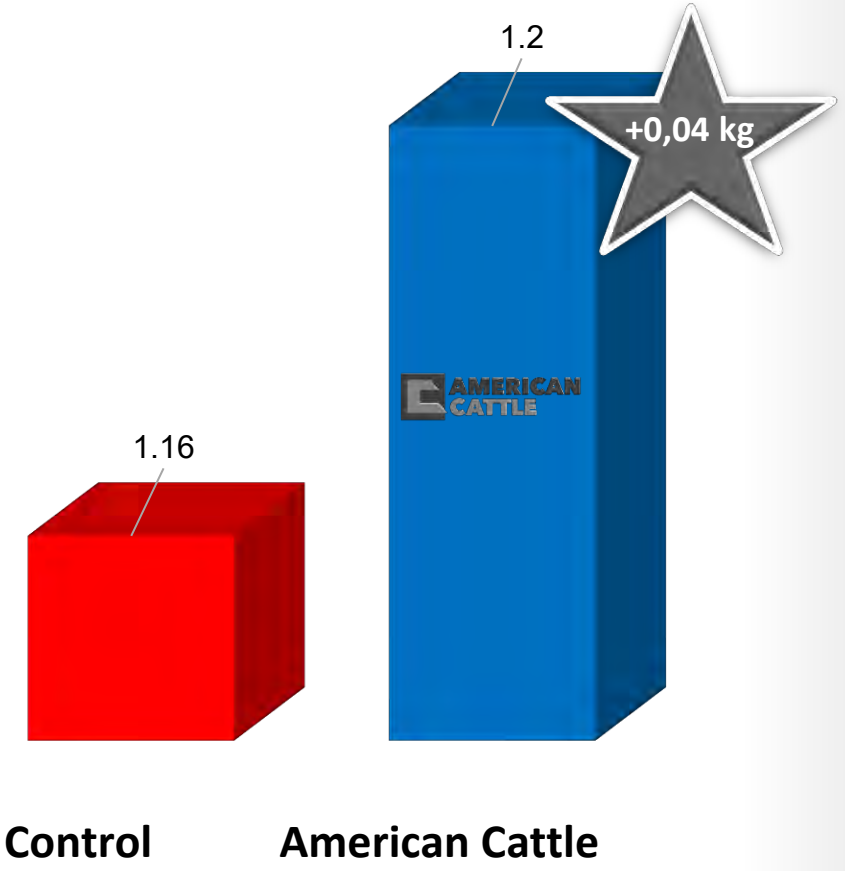


Parcial Results – Milk Composition

Fat (kg/cow/day)



Protein (kg/cow/day)

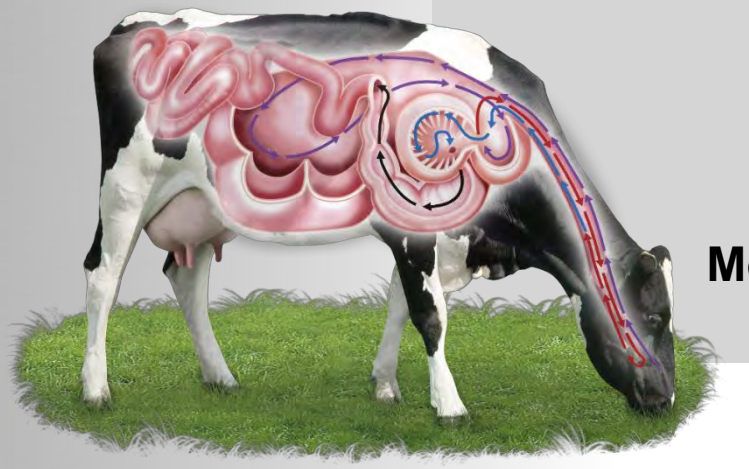


Parcial Results – Ruminal Metabolism

Table 2 - Average rumen pH of cows receiving diets with ou without feed supplement.

Parameter	Control	American Cattle	SEM	p value
Ruminal pH	5,93	6,07	0,147	0,029

Legend: SEM = Standard Error of the Mean.



Greater fiber degradation

⇩

More fat in milk
More glucose in mammary gland
Greater milk production

Parcial Results – Methane Reduction

Table 3 – Methane emissions from lactating cows receiving feed supplement.

Parameter	Control	American Cattle	SEM	p value
Methane Emission/EAMP (g/l)	8,89	6,50	0,75	0.024

Legend: EAMP = Energy-adjusted milk production; SEM = Standard Error of the Mean.

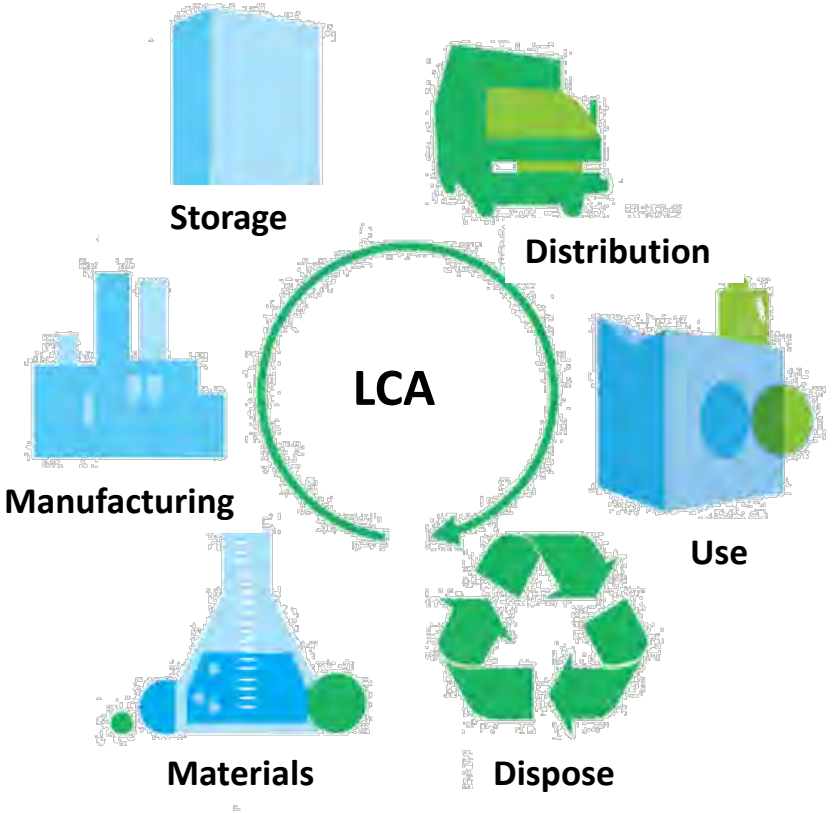
AMERICAN CATTLE

LIFE CYCLE ANALYSIS (LCA) ISO 14040:2009

INSTITUTO SENAI DE TECNOLOGIA COURO E MEIO AMBIENTE

What is Product Life Cycle Analysis...

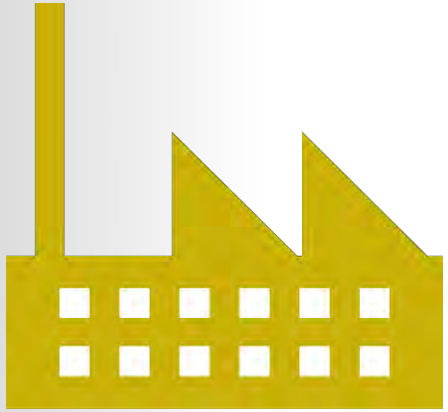
Life Cycle Assessment (LCA) is a technique developed to measure the possible environmental impacts caused as a result of the manufacture and use of a certain product or service.



Scope Life Cycle Analysis – American Cattle

Cradle to Gate Study

Origin of raw materials



Production process in suppliers

American Cattle production process

Finished product in 20 kg bags

Functional Unit:

Recommended dose of use
(50 grams/animal/day)

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American Cattle Life Cycle Analysis

Partner: INSTITUTO SENAI DE TECNOLOGIA COURO E MEIO AMBIENTE

Environmental Impact Category

Ozone Depletion

Impact of Chemicals adversely affecting the Upper ozone layer.

Global Warming

Impact GHGs increasing global temperatures.

Acidification Potencial

Indicator of the potential acidification of soils and water due to the release of gases such as nitrogen oxides and sulphur oxides

Eutrophication Potencial

Impact of Chemicals polluting rivers and lakes by removing oxygen

Ecotoxicity

Capacity of a toxic agent to cause harmful effects, such as mutagenic effects, reduce reproduction, or cause the mortality of bioindicators.

Global Warming – Type of Emission

Fossil Emission

Greenhouse gases (GHGs) that are contained in reserves (rocks, oil, soil) and are released into the atmosphere.

Ex. Fuels

Biogenic Emission

GHGs (CO_2 and CH_4) that were in the atmosphere and were absorbed during photosynthesis and then released back into the atmosphere.

Ex. Burning

Transformation of the land Emission

Soil carbon stocks that are transformed as a result of management.

Ex. Replacement of native forests with crops.

Carbon Capture Emission

Carbon capture by plant organisms through the process of photosynthesis.

Ex. Sugarcane crops

American Cattle Life Cycle Analysis

Evaluation of American Cattle emissions using SIMAPRO 9.4.0.2 software. IPCC 2021 GWP100 method *(incl. CO_2 uptake)*

Emission	kg CO_2-eq (1 kg of American Cattle)	kg CO_2-eq (50 gramas of American Cattle)
Fossil	1,69604	0,084802
Biogenic	3,1075	0,155375
Transformation of the land	0,0649	0,003245
Carbon Capture	-7,83880	-0,39194
Emissions balance	**-2,9704**	**-0,14852**

Negative carbon footprint

AMERICAN CATTLE

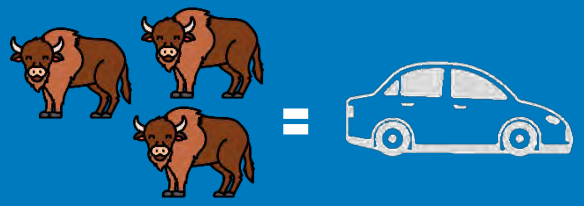
What we already know...

American Cattle has negative foot print

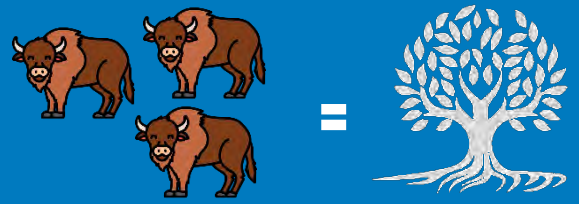
The American Cattle production process avoids carbon emissions into the atmosphere. In other words, during its production it captures more carbon than it emits.

50

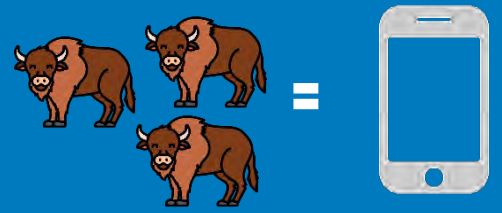
Grams/animal/day



Feeding 100 animals with American Cattle is equivalent to taking 10 cars out of circulation for 1 year.



Feeding 100 animals with American Cattle is equivalent to carbon capture from 745 trees in 1 year.



Feeding 100 cows with American Cattle is equivalent to reducing the carbon emissions of 77 iPhones.

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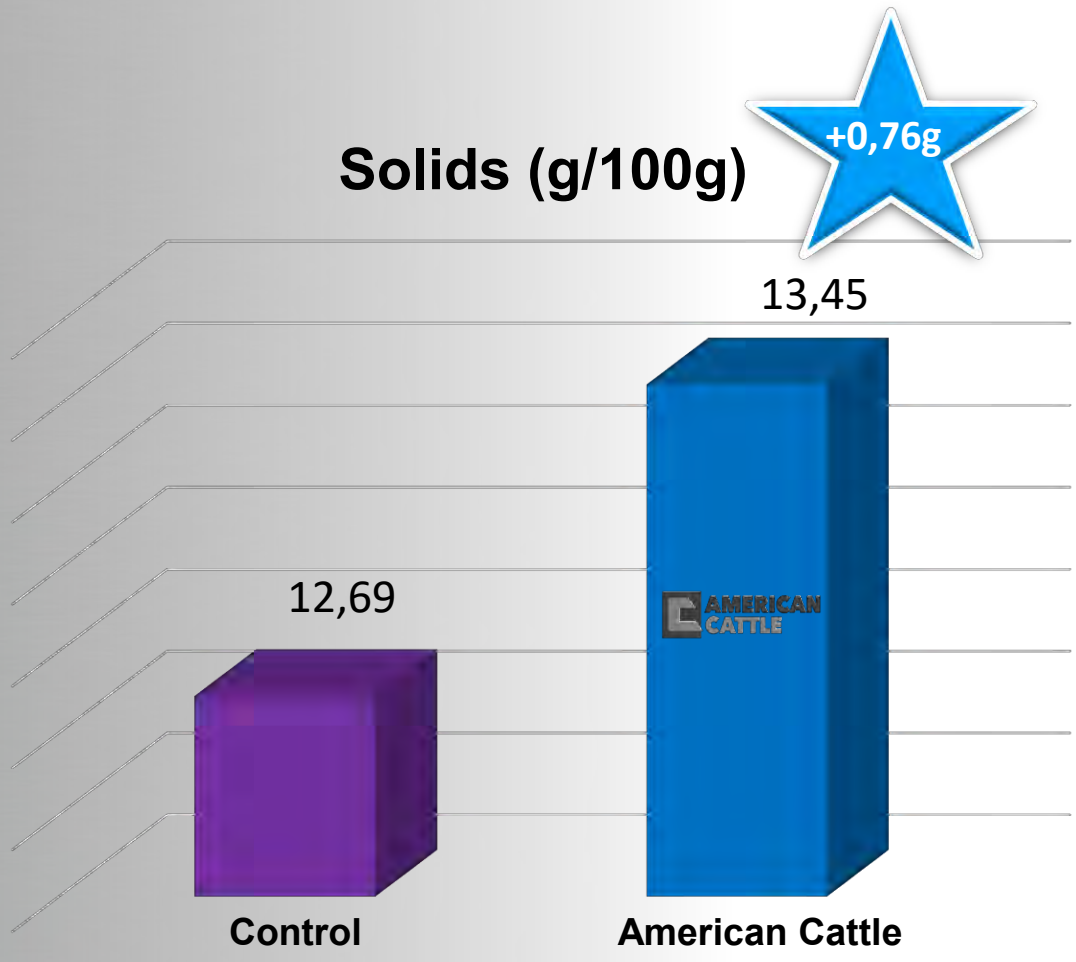
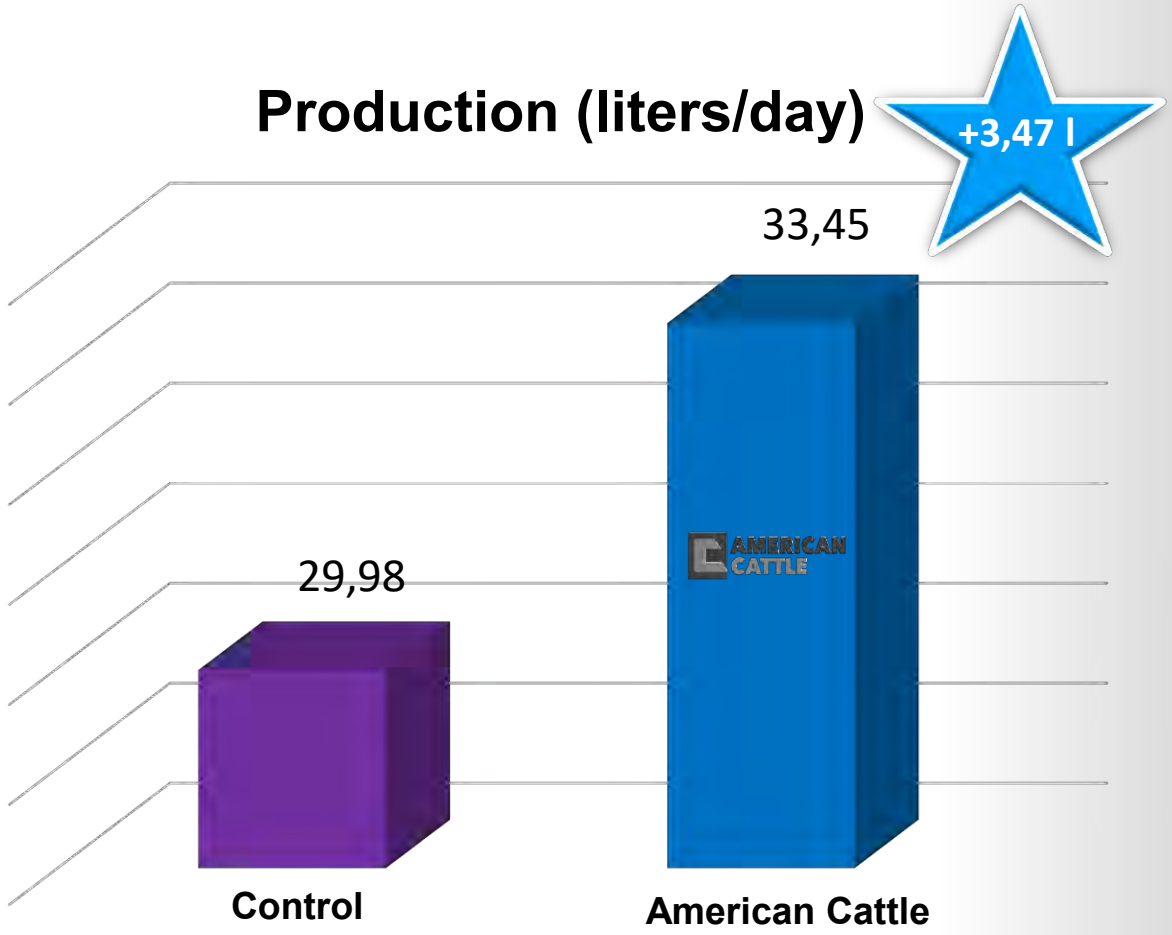
Field Studies in Dairy Cows in Brazil

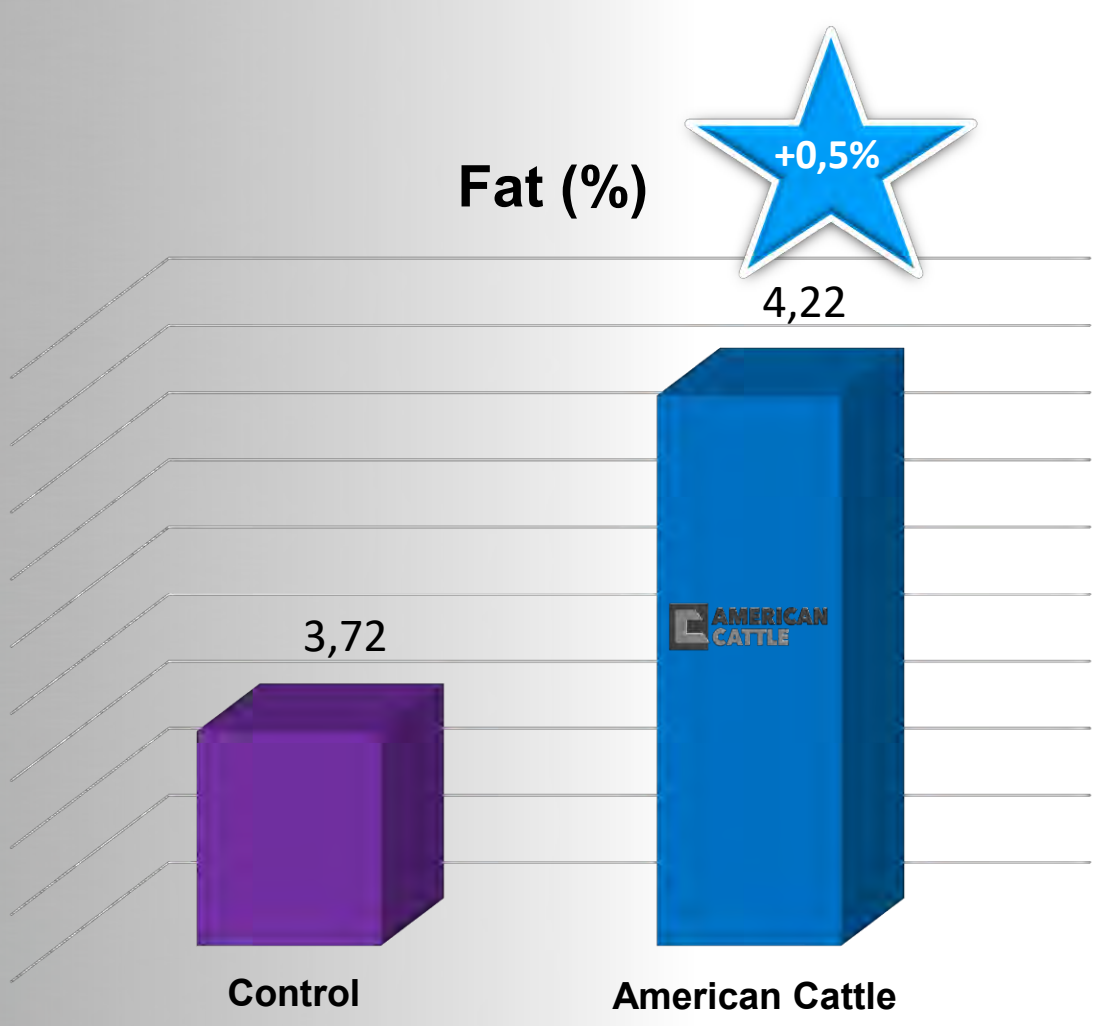
American Cattle – Field Results

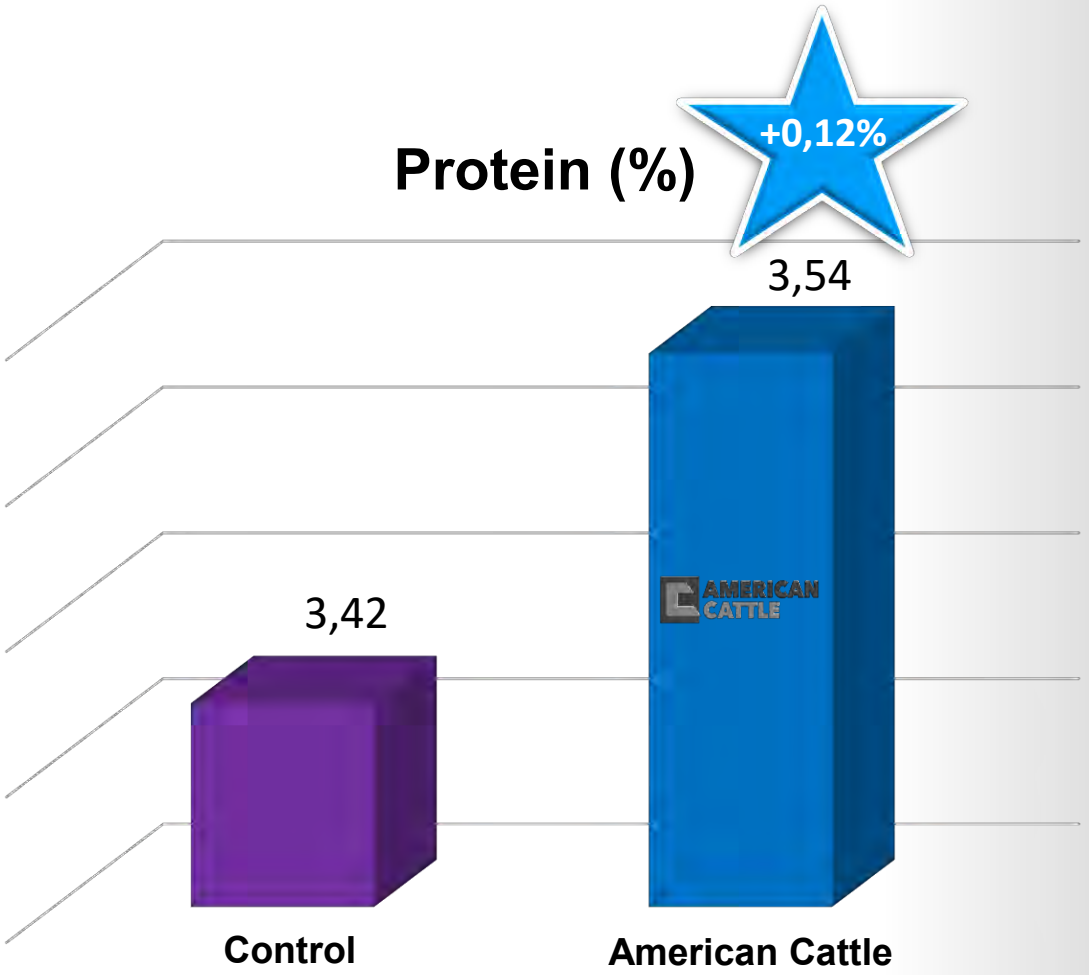




*Study carried out from January to July on a dairy farm in southern Brazil (n= 50 lactating cows).

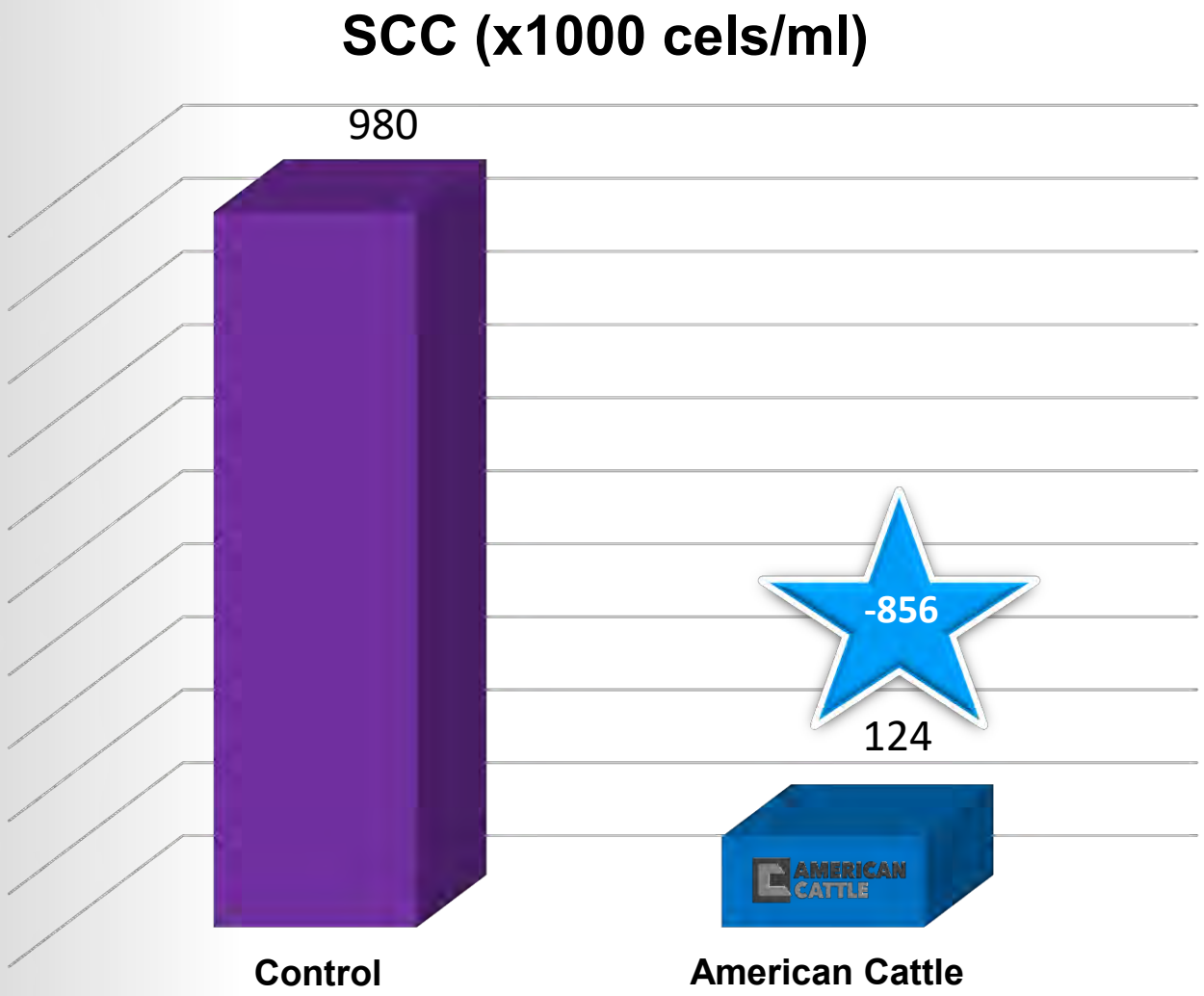
American Cattle – Field Results





*Study carried out from January to July on a dairy farm in southern Brazil (n= 50 lactating cows).

American Cattle – Field Results



*Study carried out from January to July on a dairy farm in southern Brazil (n= 50 lactating cows).

American Cattle – Field Results

Evolution of Somatic Cell Count in milk with the use of American Cattle

SCC Analysis	39 Animals 07/jun	37 Animals 06/jul	45 Animals 26/jul	48 Animals 22/Set
> 500,000	53,85%	43,24%	40,00%	29,16%
201,000 – 499,000	28,21%	24,32%	24,44%	20,84%
< 200,000	17,94%	32,44%	35,56%	50,00%

*Results regarding the use of the product on a dairy farm in southern Brazil.

AMERICAN CATTLE FOR BISON...

- Improve the production and nutritional quality of milk during the lactation period;
- Greater digestibility and weight gain;
- Greater immunity;
- More sustainable production.

Conclusions

AMERICAN CATTLE

- **100% natural** product

- Guarantee of **sustainable production**

with **lower greenhouse gas emissions**

- **Greater productivity**


THANK
YOU
CANADIAN BISON ASSOCIATION
ASSOCIATION CANADIENNE DU BISON
American®
Nutrients
SOLUTION IS OUR COMMITMENT