



ADAPTADOR

**Innovative antioxidant solutions
to improve dairy cattle performance**

The evolution of animal health



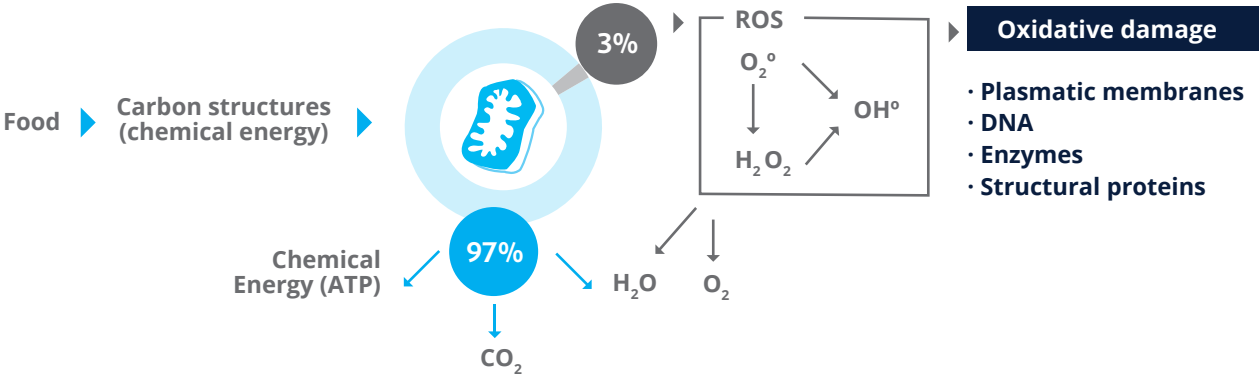
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What is Oxidative Stress and how it affects the animals?

Oxidative Stress is a result of an imbalance between the oxidative challenge and the antioxidant defense system. The oxidative damage is caused **by reactive oxygen species (ROS)**: superoxide anion (O_2°), hydrogen peroxide (H_2O_2) and hydroxyl radical (OH°),

traditionally called “free radicals”. This process implicates the rupture of the plasmatic membranes, DNA and enzymes, which **causes productive, immunological and reproductive failures in cattle**.

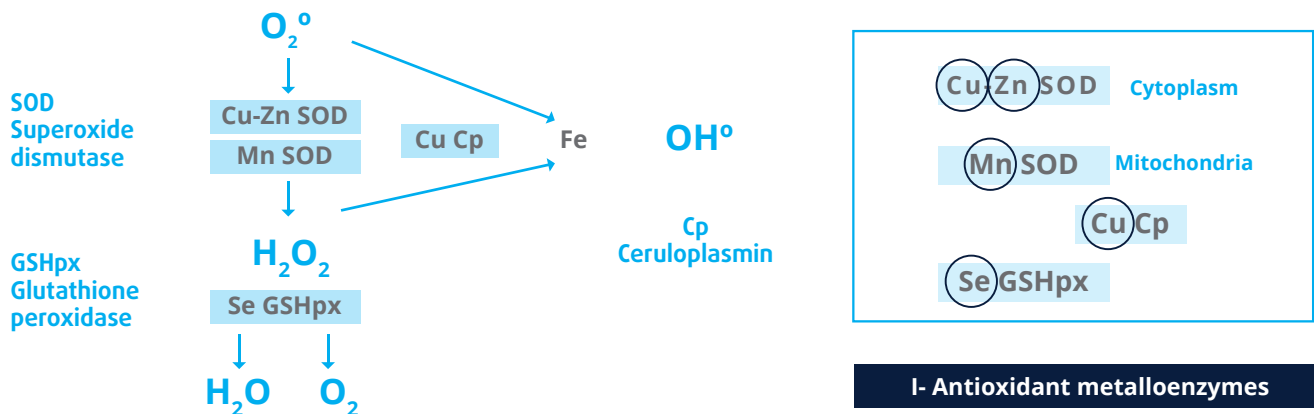
Mitochondria (ATP generator from feed)



The organism has an **antioxidant defense system** which involves enzymes that inactivate ROS, these are metalloenzymes, the organism forms the protein structure but needs the animal to incorporate the minerals that activates them. The **Superoxide dismutase (SOD)** is only active together with copper and zinc (Cu-Zn SOD) or together with manganese (Mn SOD). Glutathione

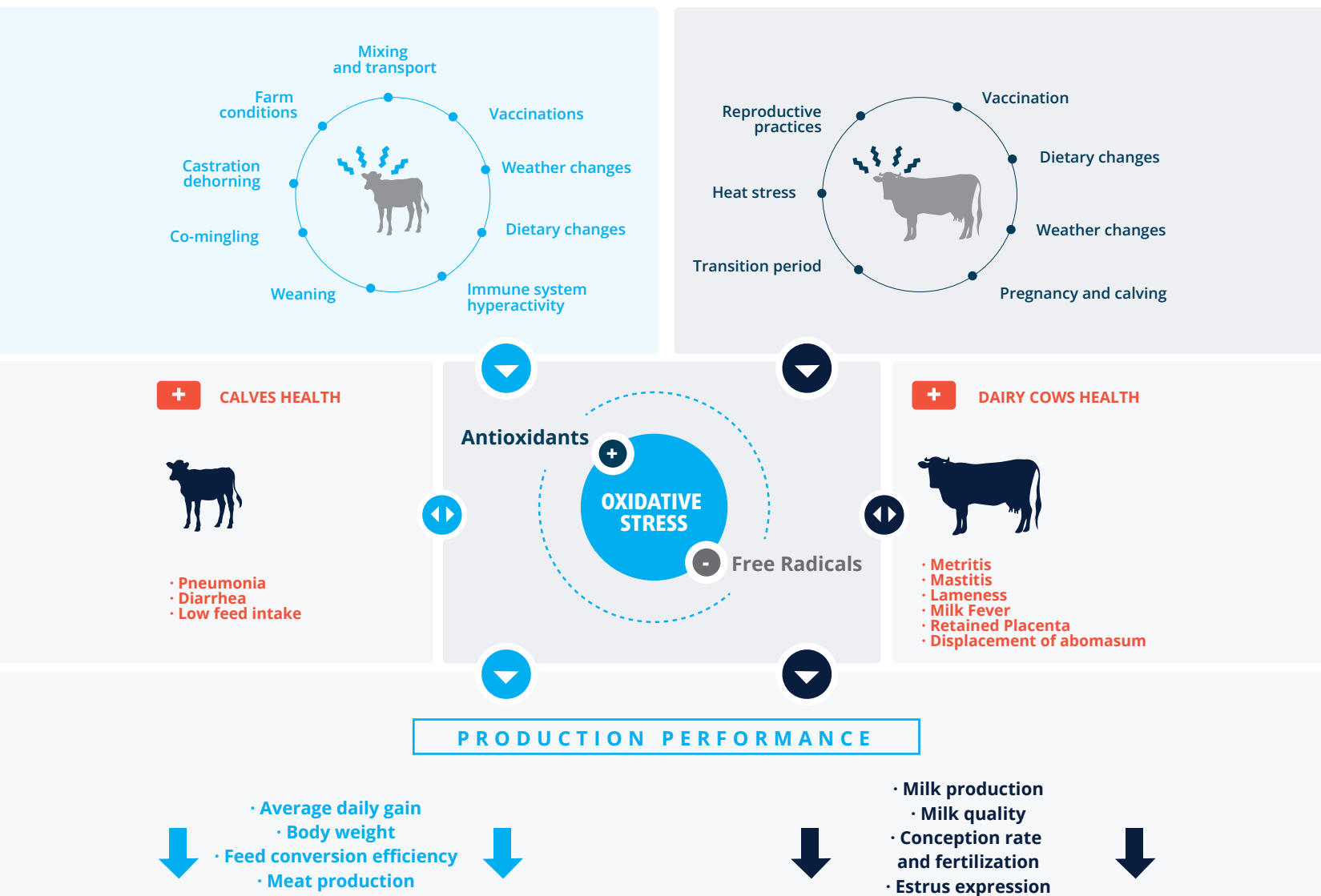
peroxidase (GSHpx), the main peroxidase enzyme of the organism, depends on **selenium**.

On the other hand, Vitamin E and Vitamin A are molecules which are exposed to damage and oxidation, protecting the tissues by disrupting the production of hydroperoxides and the spread of membranes lipoperoxidation.



Stressful situations, like adaptation to changes, immunological challenges or very high levels of production, can increase the oxidative challenge. The supplementation of minerals and vitamins related to the antioxidant defense, especially during these high demanding situations, maximizes the possibility of controlling the oxidative stress and its consequences.

Stressful situations and their impact on health and production



Advantages of injectable vitamins and minerals

- Injected minerals and vitamins can reach faster the bloodstream and body compartments than those administered by feed supplementation.
- Ensures that each animal receives the necessary level of vitamins and minerals at the right moment.
- Facilitates the individual supplementation avoiding regrouping animals separately for oral administration.
- Dry matter intake is reduced during the transition period.
- Dietary mineral supplements may not be absorbed properly due to interactions with other nutrients in the rumen. Antagonists in drinking water (e.g. iron, sulfur, molybdenum) can also have a negative effect on trace mineral absorption from the digestive tract.

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ADAPTADOR Antioxidant dairy cow protocol

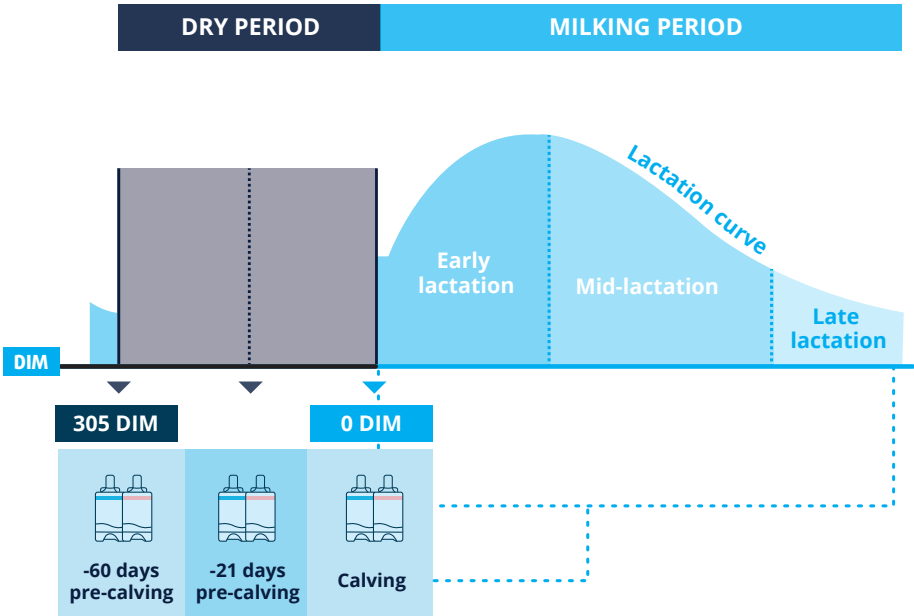
The transition from gestation to lactation, named ‘**Transition Period**’, is the most critical moment in the lactating cycle of dairy cows and entails the last 3 weeks prior to calving and the first 3 weeks after calving. During these period, dairy cows experience an important physiological stress due to important metabolic changes that generate severe oxidative

stress. The major incidence of several diseases like metritis, mastitis, ketosis, displacement of abomasum and lameness occur within the first month of lactation and they have a tremendous impact on the milk production of the whole lactation.

Biogénesis Bagó developed the **ADAPTADOR ANTIOXIDANT DAIRY COW PROTOCOL** specially for dairy farms. Easy to implement, it consists of subcutaneous injection of minerals (**ADAPTADOR MIN**) and vitamins (**ADAPTADOR VIT**) at three different moments:



Strategic implementation of the **ADAPTADOR Dairy Cow Protocol** during the dry period prepares the animal to face the upcoming metabolic challenges, **enhancing its productive and reproductive performance**, during the next milking period.



Dosage: for each product at each recommended time point.
Cows: 5 mL
Heifers: 4 mL
Easy to implement (developed for dairy farms)

Benefits of implementing the ADAPTADOR antioxidant dairy cow protocol

The ADAPTADOR ANTIOXIDANT DAIRY PROTOCOL has been implemented in several dairy farms with many beneficial results.

Benefits for dairy farmers

- Increases milk yield
- Reduces incidence of Metritis
- Reduces incidence of Mastitis
- Reduces incidence of Lameness
- Reduces need of antibiotic treatments
- Improves reproductive performance
- Self-paid by ROI (Return on Investment)



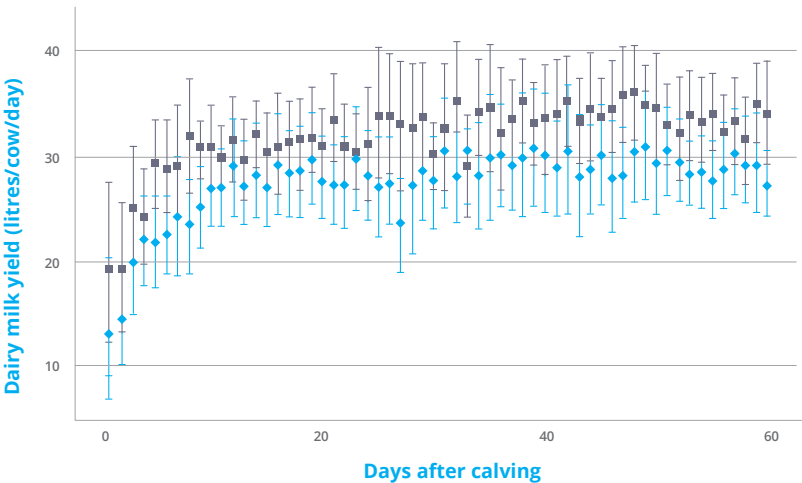
MILK YIELD & UDDER HEALTH

Parameter	Treatment Group (n=191)		Control group (n=181)		p Value
	Mean	SD	Mean	SD	
Milk yield (kg.)	38.9	5.3	34.6	5.5	0.04
Milk yield at 305 DIM	11,852.7	1479.1	10,460.2	1519.4	0.02
Average SCC (x1000)/ml	248.4	109.6	278.5	160.3	<0.001

DIM: Days in milk
SD: standard deviation
SCC: somatic cell count

Increased total milk yield (305 DIM) in 13%

Better udder health (less SCC)



Increased total milk yield during the lactation period until 60 days in milk

CG: Control group - TG: Treatment group

MILK COMPOSITION
No effect on milk content of fat and proteins.

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MASTITIS, METRITIS AND FERTILITY

Parameter	Treatment Group (n=191)		Control group (n=181)		P Value
	Mean	N	Mean	N	
Retention fetal membranes (%)	13.5	28	26.3	47	0.04
Metritis (%)	13.6	26	26.2	46	0.02
Mastitis (%)	9.9	18	14.9	27	0.04
Pregnancy rate at 30 days after 1 st service (%)	44.4	86	34.7	64	0.03
Pregnancy rate at 60 days after 1 st service (%)	41.2	79	30.8	57	0.02

Reduced fetal membranes retention (around 50%)

Reduced incidence of metritis (around 50%)

Reduced incidence of mastitis (around 30%)

Increased pregnancy rates (almost 11%)

METRITIS

A second trial showed a reduction in the probability of METRITIS occurrence in almost 50% of multiparous dairy cows (26% of incidence in Control Group cows vs 14% in Treatment Group).



ADAPTADOR MIN

COMPOSITION

- Copper 1.0g
- Zinc 4.0 g
- Manganese 1.0 g
- Selenium 0.5 g
- **MABS® AQUA**
- Excipients q.s. 100 mL

ADAPTADOR VIT

COMPOSITION

- Vitamin A 3.5 g
- Vitamin E 5 g
- **MABS® OLEO**
- Excipients q.s. 100 mL

MABS® Technology

Is an exclusive Modifier of Absorption system developed and patented by Biogenesis Bagó, which provides longer and higher bioavailability.

MABS® PLATFORM was developed to deliver unique formulations for **ADAPTADOR MIN** with **MABS AQUA** and **ADAPTADOR VIT** with **MABS OLEO**, making the most valuable tools for oxidative stress control.



MABS®
Modifier of Absorption Platform
by Biogenesis Bagó



**Biogenesis
Bagó**

ADAPTADOR antioxidant results in calves

Calves experience different challenging situations in their lives:

- Born with an **immature immune system**.
- **Weaning:** during this critical period, there are drastic changes related primarily to the transition from a liquid to a solid diet. The metabolic stress associated with weaning can be severe, compromising the

antioxidant system (Sundrum, 2015) and generating oxidative stress (Bordignon et al., 2019).

- Abrupt exposure of neonates to environmental oxygen generates oxidative stress.
- Possible **changes of facilities and several practices** such as dehorning, castration, commingling, transportation, diet changes.

Benefits in calves

- Enhances the immune system
- Increases immune response after vaccination
- Increases daily weight gain
- Improves the antioxidant defense system



1 ml/50 kg in calves up to 200 kg. In young animals 4 mL as total dose.

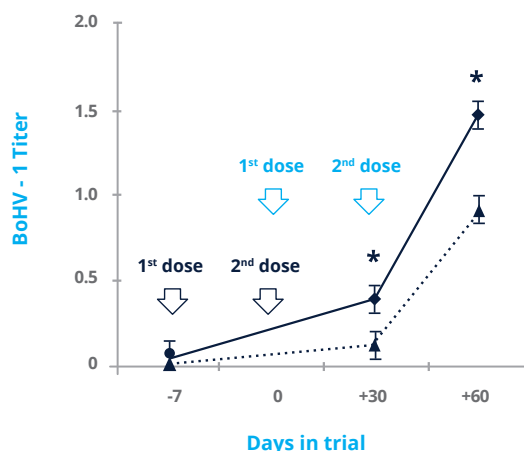
Before and at weaning or only at weaning (7 to 15 days)

Before stressful situations:

- Transportation
- Vaccinations
- Any procedure

Strategic treatment with ADAPTADOR before and at weaning can positively impact on immune response and on Reactive Oxygen Species (ROS) release.

Immune response

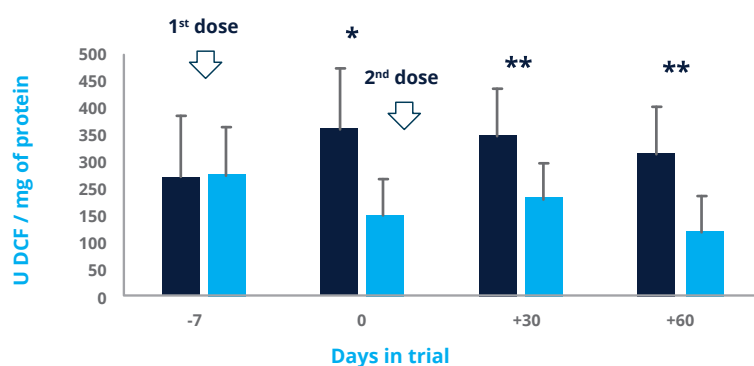


Control (dotted line with triangles), Treated (solid line with circles), * p<0.05. Arrows indicate 1st dose at Day -7 and 2nd dose at Day 0.

Day 0 = weaning

Calves are more protected to diseases

Reactive oxygen species



Control (dark blue bars), Treated (light blue bars), * p<0.05, ** p<0.01.

Arrows indicate 1st dose at Day -7 and 2nd dose at Day 0.

*p<0.05 **p<0.01

Day 0 = weaning

Reduced ROS levels, preventing them from limiting calves' performance

The evolution of animal health



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