



Selisseo®

**ADISSEO**  
A Bluestar Company

# Reducing the Impact of Heat Stress WITH SELISSEO®

## THE TRACE ELEMENT SELENIUM IS IMPORTANT FOR A VARIETY OF REASONS:

- Optimum immunity: reducing Mastitis/SCC, Metritis/RP, the impact of oxidative stress
- Reproductive performance of both male and female cattle
- Maintaining meat quality
- Milk production
- Thyroid function
- Avoiding “White Muscle Disease” in young stock

Additionally, research has shown that Selenium is effective in reducing some of the negative effects of heat stress (HS) in dairy cows. Excess environmental temperature causes oxidative stress and the production of Reactive Oxygen Species (ROS). Selenium helps counteract the negative effects of ROS by contributing to the production of antioxidant enzymes.

A study conducted in 2019 by Sun and coworkers examined the effects of the source of Selenium on several parameters in cows experiencing heat stress through the use of environmental chambers. The study pointed to the value of supplementing heat stressed cows with organic selenium in the form of Hydroxy-Selenomethionine (HMSeBA).

Eight mid-lactation mature cows (141 ± 27 DIM) were fed the same diet supplemented with either 0.3 ppm inorganic (Sodium Selenite) or HMSeBA (Selisseo®). The trial was divided into three continuous periods: a covariate period (9 d), a thermal neutral (TN) period (28 d), and a HS period (9 d).

**TABLE 1.**  
Effects of selenium source on selenium concentration in serum and milk during heat stress period

ITEM	TREATMENT <sup>1</sup>		P-VALUE
	SS-0.3	HMSeBA-0.3	Trt
Serum total Se, µg/L	102	128	0.03
Milk total Se, µg/L	29.9	51.2	<0.01

<sup>1</sup> SS-0.3 mg of Se/kg of DM sodium selenite supplementation; HMSeBA-0.3 mg/kg of DM hydroxy-selenomethionine supplementation.

Both milk and serum selenium concentrations were significantly higher in animals treated with HMSeBA (Selisseo) indicating Selisseo's higher bioavailability compared to sodium selenite (SS).

Continued >



**TABLE 2.**  
**Effects of selenium source on blood oxidative parameters under heat stress period**

ITEM	TREATMENT <sup>1</sup>		P-VALUE
	SS-0.3	HMSeBA-0.3	Trt
Glutathione peroxidase, U/mL	97	107	0.41
Superoxide dismutase, U/mL	83.1	89.5	0.11
Total antioxidant capacity, U/mL	2.0	2.4	0.04
Malondialdehyde, nmol/mL	7.1	6.2	0.03
Hydrogen peroxide, mmol/L	43.7	35.6	<0.05
Nitric oxide, µmol/mL	32.7	25.2	0.04

<sup>1</sup> SS-0.3 mg of Se/kg of DM sodium selenite supplementation; HMSeBA-0.3 mg/kg of DM hydroxy-selenomethione supplementation.

The antioxidant enzymes glutathione peroxidase and superoxide dismutase were numerically increased in the animals fed Selisseo® vs. SS. Other oxidation indicators were significantly improved by feeding Selisseo (lower malondialdehyde, hydrogen peroxide, and nitric oxide).

**TABLE 3.**  
**Effects of selenium source on DMI and milk production during heat stress**

ITEM	TREATMENT <sup>1</sup>		P-VALUE
	SS-0.3ppm	Selisseo®-0.3ppm	Trt
DMI, lb/d	24.0	25.6	0.57
Milk yield, lb/d	42.5	46.5	0.08
ECM lb/d	47.4	48.7	0.85

<sup>1</sup> SS-0.3 mg of Se/kg of DM sodium selenite supplementation; HMSeBA-0.3 mg/kg of DM hydroxy-selenomethione supplementation.

\* Dry matter intake and milk yield during the thermal neutral period were 37.9 and 68.5 lb/d, respectively.

Table 3 shows the effects of selenium supplementation on some production variables. Only milk yield approached significance with this small number of animals in mid-late lactation. The heat stress significantly affected both DMI and milk yield. However, the number of cows on Selisseo did not drop as far as the animals fed SS.

## Conclusion

The authors concluded, “Therefore, during HS, Selisseo supplementation may be an effective dietary strategy to minimize the negative effects of environmental hyperthermia.”

The most important mitigation factors for heat stress are fans, sprinklers, water availability, and a comfortable stall. Yet, the organic selenium provided by Selisseo is an additional low-cost, incremental investment to help mitigate the impact of heat stress on dairy cows.

## Reference

Sun, L.L., S. T. Gao, K. Wang, J. C. Xu, M. V. Sanz-Fernandez, L. H. Baumgard, and D. P. Bu. 2019. Effects of source on bioavailability of selenium, antioxidant status, and performance in lactating dairy cows during oxidative stress-inducing conditions. *J. Dairy Sci.* 102:311-319.

