

Effect of DeviCool® on lactating sow performance in Italian summer conditions

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Introduction

Global warming is causing more extreme weather phenomenon in temperate and Mediterranean climate zones. Genetic selection for increased litter size together with leaner genotypes has produced sows with a lower voluntary feed intake much more prone to suffering from summer heat stress (HS) (1). A threshold of 25°C was sufficient to provoke HS, cause prolonged farrowings and reduced feed intake (2). The influence of high environmental temperature has been shown to lower the sow's performance (3). Data from a large Spanish database has shown a seasonal "high" in piglet mortality and weaning to service interval in the months of August and September. (4) The last decade has seen increases in pig production in typically hot climates such as Asia, South America and Spain. The need for a nutritional strategy to combat the ever common phenomenon of HS during lactation is urgently needed. Due to the reduced feed intake in periods of heat stress, the lactating rations must be concentrated specially in terms of energy and vitamins.

The objective of this study was to test the effects of a feed additive, DeviCool®, on the sow's performance under HS conditions.

Materials and Methods

120 sows were weighed and backfat(P2) was measured for each sow on entry to the farrowing house and at weaning to record weight and body condition loss. Temperature and humidity were recorded, every thirteen minutes, throughout the whole lactation period. Sows were divided into two groups and balanced for parity and body weight. The control group was fed the standard farm mixed farrowing ration. The treatment group was fed the same ration with the addition of 3kg/ton of DeviCool®, containing agents known to help with vaso dilazione as well as calcium and potassium homeostasis, thus reducing heat production. Individual piglets heat production from seven litters from both the control and the treatment groups were individually identified at birth and weighed at birth and weaning.

Statistical analysis was performed using IBM SPSS version 25.0

Results

The temperatures in the farrowing housed ranged from a minimum of 24,7°C to a maximum of 34,6°C with an average of 27,9 and a relative humidity of 65%. There was a total of over 5.000 temperature recordings. In the control group, 82% of the recordings were >24°C, and in

the treatment group 88% of the readings were > 24°C.

No significant difference in weight and backfat(P2) losses were found during lactation between the control and treatment groups. Sows that were offered the DeviCool® treatment had a numerically lower piglet mortality (10,84% vs 14,88%). The difference, however, was not significant. An increased daily live weight gain was observed in the piglets in the treatment group (Table 1).

Table 1. Piglet daily live weight gain

	Control	Treatment	SEM	Sig
DWG(g/day)	0,189	0,210	0,003	<0,001

Conclusions and Discussion

Metabolizable energy intake is decreased at environmental temperatures above UCT, which can range between 18 and 22°C (5). A decline of 25% in milk yield was observed after four days at 28°C (5). Another study showed 18% lower mean litter daily gain in HS conditions (6). The reduction in piglet daily liveweight gain at temperatures over 25°C (3) were very similar to the control data in this study. Considering more than 80% of the temperature recordings were in excess of 24°C, we can assume that HS was present in all of the sows.

Modern hyper prolific sows can be in a severe catabolic state and undergo increased oxidative damage during late gestation and lactation (7). In conditions of high oxidative stress, there will be reduced reproductive performance in terms of lactating capability and subsequent weaning to service interval.

The feed additive DeviCool® has been shown to be effective in increasing the piglet daily live weight gain and tending towards reducing preweaning mortality. From an economic point of view, the lower mortality and increased weight of the piglets, under Italian market conditions, produced a return on investment of 6:1.

Acknowledgments

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