

Evaluation of Actifor® Boost on milk performances of dairy cows during heat stress

Commercial dairy farm (Taiwan)

Year: 2015

Aim of the trial

Actifor® Boost has been formulated to improve milk performances of dairy cows, by increasing the energy and protein efficiency in the rumen.

The purpose of this trial was to assess the effects of the additive Actifor® Boost on production performance of dairy cows under heat stress conditions. Milk quality parameters (protein, fat and SCC) as well as milk urea were also considered.

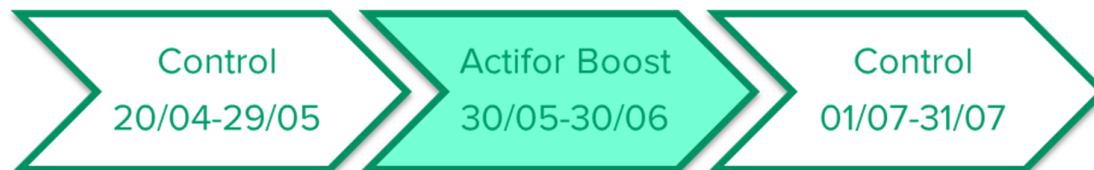
Key words: dairy cows, milk performances, heat stress, Actifor® Boost

Material and methods

This trial was run from April 20th to July 31st in a commercial dairy farm in Taiwan and involved a group of 140 Holstein cows. This group of cows had an average of 234 days in milk (DIM). The following diets were successively offered, according to Figure 1:

- Control: Control diet
- Actifor®: Control diet + Actifor® Boost (5g/cow/day)

Figure 1. Trial design



The following measurements were done for every cow:

- Individual milk yield → monthly
- Individual milk composition (fat, protein, urea, SCC) → monthly

All the cows received the same TMR, based on around 5% refusals everyday (see Table 1) and there were no changes in the raw materials during the trial period. The analytical values of the TMR are

provided in Table 2. In order to make sure that Actifor® Boost was supplemented evenly to all the animals throughout the trial, it was diluted (95% of wheat bran + 5 % Actifor® Boost) and top-dressed directly in the TMR.

Table 1. Diet's composition at the feeding table

TMR ingredients (kg/cow/day)	As fed
Alfalfa hay	6.00
Corn silage	18.00
Oat hay	1.00
Barley hay	2.00
Flaked corn grain	0.50
Soya bean meal	2.16
Corn grain	5.10
DDGS	0.22
Soya hulls	0.50
Whole soya beans	0.81
Wheat bran	1.20
Fish meal menhaden	0.19
Bypass fat	0.36
Limestone	0.21
Salt	0.10
Soda bicarbonate	0.25
Monocalcic phosphate	0.09
Metasmart	0.03
Diamond V	0.10
Minerals and Vitamins	0.08
TOTAL	38.90

Table 2. Diet nutritional composition

Nutritional composition (DM basis)		TMR
Dry matter	%	60.1
Net Energy Lactation	MCal/kg	1.72
Crude Protein	%	15.7
RDP	%	9.74
RUP	%	5.96
Starch	%	26.5
Sugar	%	4.9
EE	%	5.2
NFC	%	40.2
ADF	%	20.2
NDF	%	32.5
Met	%MP	2.28
Lys	%MP	6.68

Results

The average results of control and Actifor® Boost periods are shown in Table 3 and the comparison between the two periods is shown on Table 4.

Table 3. Performances results during the different periods

	Control period	Actifor® Boost period	Control period
Number of animals	140	140	140
Average DIM	244	259	285
Milk yield (kg/cow/day)	30.6	30.5	27.2
ECM* (kg/cow/day)	31.9	32.0	29.1
Milk fat (%)	3.64	3.66	3.76
Milk fat (g/day)	1116	1118	1024
Milk protein (%)	3.18	3.21	3.31
Milk protein (g/day)	971	981	902
MUN (mg/dL)	8.0	5.8	9.7
SCC (x10³/mL)	210	210	329

*ECM equation used: Milk production*0.327+12.95*Fat production+7.65*Protein production.

Milk production, Fat production and Protein production in kg/day

Table 4. Comparison between the control and Actifor® periods

	Control period		Actifor® Boost period		Actifor® Boost Effect ^{1,2}
	Average	SD	Average	SD	
Milk yield (kg/cow/day)	29.31	0.41	31.74	0.58	+2.43 (***)
ECM* (kg/cow/day)	30.41	0.37	32.70	0.51	+2.29 (***)
Milk fat (%)	3.593	0.039	3.560	0.055	-0.033 (ns)
Milk fat (g/day)	1053.6	16.8	1137.5	23.6	+83.9 (***)
Milk protein (%)	3.177	0.017	3.180	0.024	+0.003 (ns)
Milk protein (g/day)	932.5	9.6	1014.6	13.6	+82.1 (***)
MUN (mg/dL)	8.699	0.181	5.807	0.255	-2.892 (***)
Log₁₀ SCC	5.048	0.040	5.003	0.057	-0046 (ns)

*ECM equation used: Milk production*0.327+12.95*Fat production+7.65*Protein production.

Milk production, Fat production and Protein production in kg/day

¹measured as the difference between the averages of Actifor® Boost periods and of control periods

²statistical significance: non significant (ns), P<0,5 (*), P>0,01 (**), P>0,001 (***)

During the distribution of Actifor® Boost, the cows exhibited higher milk performances, in terms of milk yield and milk protein (both in percentage and total synthesis). Regarding milk fat, the values in percentage were lower but in total synthesis were higher.

The use of Actifor® Boost led to a maintenance of milk production during the hot season, seen when comparing milk yield performance from the first control with Actifor® Boost group. After removing

Actifor® Boost from the diet the milk yield dropped. In total the use of Actifor® Boost led to an improvement not only on milk yield (+2.43kg/cow/day) but also on ECM production with an additional 2.29kg/cow/day. This improvement was followed by a higher production of protein (82.1g/cow/day). The results show us a decrease of MUN values as well as SCC.

Conclusion

In this trial, under heat stress conditions, the use of Actifor® Boost fed on top, led to an increase of the milk yield and ECM. The decrease of MUN values and the increase of protein content show that Actifor® Boost has a positive effect on protein efficiency.

During this trial we could also see a lower count of somatic cells on the Actifor® Boost period, showing an effect on the immune system of the animals.

Collectively, these results show that during hot seasons, adding Actifor® Boost to the TMR stabilizes the performances of dairy cows, while keeping the same ration, under commercial farm conditions.