

# How to improve feed intake, especially under stressful conditions

Feed intake is a key element to maintain a high level of performance. When this crucial factor deteriorates, zootechnical and economical performances can fall.

Several factors can affect feed intake and many of them are caused by oxidative stress and/or inflammation, including sanitary pressure, vaccinations, feed transitions, weather conditions (high temperatures, humidity), transport, human manipulations, and environmental changes.

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Under oxidative stress and inflammation, 30% of the performance drop is explained by the catabolism and feed conversion needed to manage inflammation and 70% of the performance drop is explained by a lower feed intake.

## Examples of heat stress

Heat stress is a factor that may cause a drop in feed intake. Quinteiro-Filho in 2008 and 2010 showed that a 31°C temperature applied for 10 hours on 35-42 day old chickens leads to:

- -25% WDG.
- -20% feed intake.

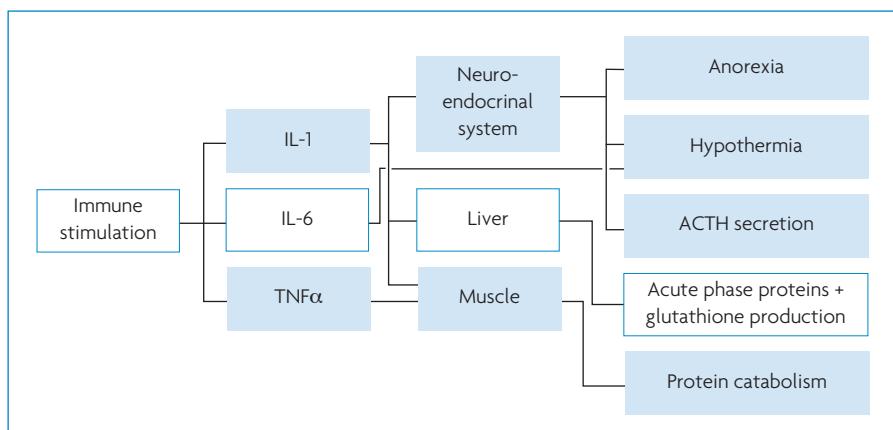


Fig. 1. Axion feedstim action on cytokines modulation (blue blocks).

- +3% FCR.
- +26% mortality.

Other studies also showed that heat stress had a high impact on performance.

For laying hens, many studies show that egg weight is impacted from 23°C (-0.4% between 23°C and 27°C; -0.8% >27°C), laying rate drops from 30°C and feed conversion ratio falls from 28°C.

In order for poultry producers to evaluate the risk level of heat stress in farms, CCPA Group has developed a heat stress application for smartphones entitled ThermoTool, which can be downloaded for free on Iphone and Android devices via their respective App stores.

Thanks to this application, breeders can anticipate heat stress over five days and

quickly adapt, if necessary, the management of their farm and the nutrition of the flock.

## A global approach to nutrition and health

Due to the wide variety of stress conditions, it is very difficult to solve them with a unique and single mode of action. Among the possible options, nutrition can play an important role.

Indeed, reducing the acute inflammatory response and oxidative damage during stress periods is necessary to improve egg production as well as growth.

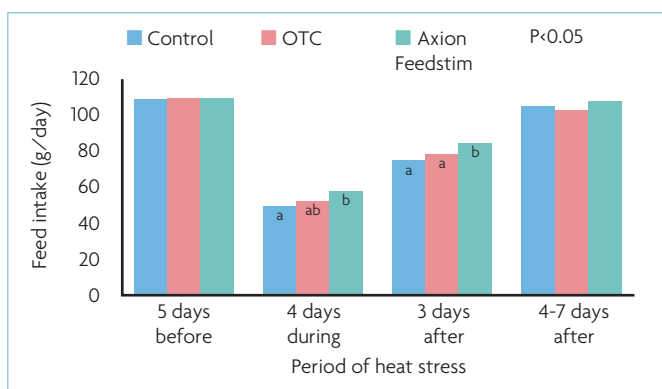
The R&D department of the CCPA Group  
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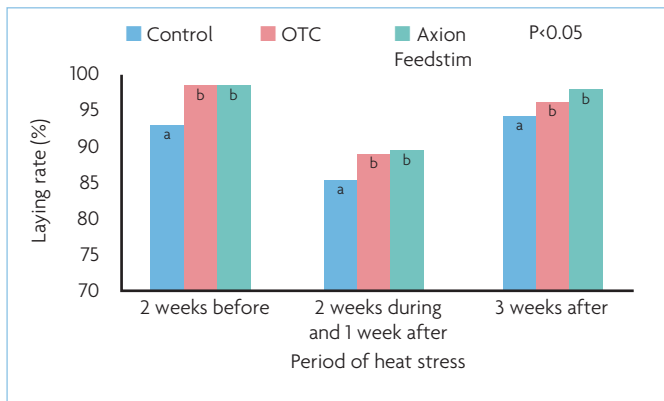
Table 1. Feed intake, growth rate and feed conversion of broilers raised under varying temperatures.

Temperature (°C)	Feed intake (g/day)	Growth rate (g/day)	Feed conversion (g/day)
25	91.91a	34.84	2.65
35	77.31	30.55	2.57
25	91.87	34.06	2.75
30-40	78.17	29.80	2.65

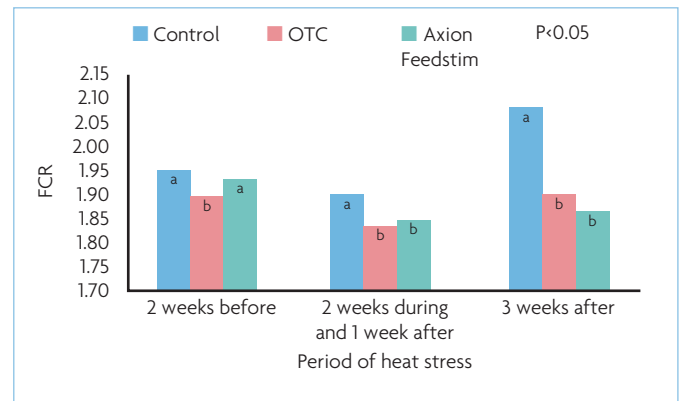
Feed conversion = Feed intake (g)/weight gain (g) Means do not differ significantly (P<0.05) International Journal of AgriScience Vol 2(8): 675-683, August 2013.

Fig. 2. Feed intake.





**Fig. 3. Laying rate.**



**Fig. 4. Feed conversion ratio.**

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selected a specific plant extract, which clearly demonstrates in vitro and in vivo anti-inflammatory and antioxidant properties (International patent pending). Axion Feedstim is a phytogenic feed additive combining this concentrated extract and selected vitamins, trace elements and other synergistic plant extracts. Incorporated into complete feed, Axion Feedstim is developed to act at different levels:

- Its active substances have the ability to reduce cytokine production (especially TNF $\alpha$  and IL-1) and to modulate the level of inflammation. This modulation contributes to promote feed intake, body temperature regulation and to reduce protein muscle catabolism.
- Axion Feedstim can also capture and reduce the level of free radicals, causing oxidative stress. Indeed, it boosts the macrophage antioxidant capacity by inducing a specific expression of its genome (via intra-cellular superoxyde dismutase).

### Trial results for layers and broilers

#### ● Trial 1. Experimental trial in laying hens (France, 2013):

In the protocol, 72 laying hens (30 weeks old) were divided into three groups: negative control group, positive control group (with 400ppm of oxytetracycline -

OTC) and Axion Feedstim group (2kg/T of complete feed). Laying hens were put under the same conditions for three weeks and were then submitted to heat stress of 35°C, 24 hours per day, for four days.

After this period, normal conditions were restored for four weeks. The parameters measured were feed intake, laying rate and feed conversion ratio.

The feed intake during heat stress was significantly higher with Axion Feedstim than the OTC and control groups (+5g/day and +7g/day respectively). Axion Feedstim has a better positive effect on feed intake many days after heat stress: +10g/day than in the control group, three days after heat stress and +2g/day than in the control group, seven days after heat stress.

The laying rate with Axion Feedstim is significantly higher, especially during heat stress than in the control group. Results between OTC and Axion Feedstim groups tend to be equal.

Feed conversion ratio (FCR) is significantly higher with Axion Feedstim during and after heat stress than in the control group. FCRs with Axion Feedstim and OTC groups are similar. Overall, Axion Feedstim allows a better feed efficiency and a better nutrient gut valorisation.

#### ● Trial 2. Field trial in broilers (Czech Republic, 2015).

In the protocol, there were 1.2 million broilers in the control group (34 batches)

with classic feed versus two million animals for the Trial group (60 batches) with classic feed and Axion Feedstim at 0.2% into complete feed.

Trials were made under hot conditions (summer, >30°C). The parameters measured were weight, feed conversion ratio and mortality. The results are described in Table 2. All criteria are improved with Axion Feedstim.

Slaughter age is significantly reduced with the Axion Feedstim addition by almost one day. FCR is significantly reduced by 3% for trial group. The performance index is significantly better for trial group: 339 versus 321 for the control group.

### Summary

To sum up, the Axion Feedstim nutritional approach – via its selected plant extracts – operates at different levels of the inflammatory process and enables feed intake to be maximised, leading to a better feed conversion ratio and animal comfort.

In a market more and more receptive to money savings, animal welfare and respect for the environment, CCPA Group's new approach is definitely an interesting way to improve breeding profitability, for both layers and broilers. ■

References are available from the author on request

**Table 2. Results from the field trial in broilers (Czech Republic, 2015).**

		Slaughter age	Weight	FCR	Mortality	Performance Index
Control	N	48	48	48	48	48
	Average	34.1	1.972	1.721	6.0	321
	Pooled SD	1.14	0.117	0.100	2.9	31
Axion Feedstim	N	75	75	75	75	75
	Average	33.3	1.982	1.680	5.5	339
	Pooled SD	1.02	0.107	0.087	2.0	26
Difference		-0.8	0.010	-0.041	-0.54	19
P		<0.001	0.624	0.017	0.226	<0.001