Optimising milk yield and cow health and welfare, naturally

The two months before and after calving are a challenging period for dairy cows. Since 2009, herd observations made in partnership with the French Agronomic Public Research Institute (INRA) have showed a drop in antioxidant reserves one month before calving, with these reserves replenishing within two months of calving.

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A peak of inflammation was observed at the same time one week after calving, as well as a lack of antioxidant substances in some animals, leading to metabolic problems and a decrease in milk production.

The consequences of calving stress and inflammation on animal health have dominated the scientific news worldwide for the past 10 years.

The CCPA Group has been collaborating on this subject with various French and international research teams, including Dr Barry Bradford's team, from Kansas State University, to test natural alternatives to existing anti-inflammatory products.

Effect on milk yield

The CCPA Group's R&D team, and in particular its laboratory with recognised expertise in plant extracts, has developed a natural solution based on antioxidants, including Scutellaria baicalensis extracts, as well as vitamin C, green tea and grape extracts, since 2013 – entitled Axion Start.

This natural solution was first tested in 2014 in farms of the CCPA Group's national reference network, followed in 2014-2015 by trials in various European countries, including the Czech Republic, Hungary and Italy.

The results of these tests show an average improvement of 2.7 l/d of milk, with an even more significant improvement (+4.6 l/d), for the 2016 American Kansas trial (see below and Table 1).

Table 1. Impact of supplementation with Scutellaria baicalensis extracts (Axion Start) on milk production and quality 60 days after calving.

	Control	Axion Start
Milk production (kg/d)		
D1-63	42.46	47.19
D64-301	35.39	40.02
Fat content (%)		
D1-63	3.84	3.84
D64-120	3.24	3.29
Protein (%)		
D1-63	3.16	3.12
D64-120	2.97	2.97
Lactose (%)		
D1-63	4.87	4.95
D64-120	4.92	4.97
Somatic cells (log^{10} cells/ml)		
D1-63	2.19	1.86
D64-120	2.13	1.91

Source: Kansas State University, farm trial, 2016.

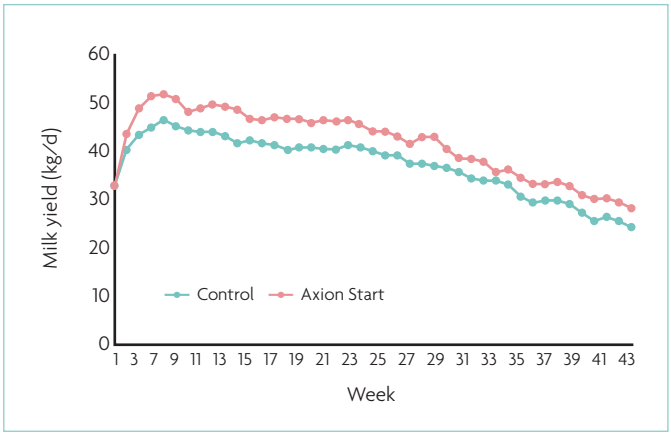

Fig. 1. Impact of 60 day supplementation with Scutellaria baicalensis extract (Axion Start) on milk yield.

An original mode of action

The work carried out as early as 2015 with INRA in Rennes had shown the positive effects of Scutellaria baicalensis on udder physiology, particularly on the continuous renewal of mammary cells during lactation, with higher number of milk secreting cells.

In summary, three modes of action of Scutellaria baicalensis can be distinguished: an antioxidant and anti-inflammatory effect improving peak lactation, a reduction in lactating cells mortality leading to better lactation persistence, and a better integrity of the mammary epithelium protecting it from external aggressions.

Milk production is therefore increased without negative consequences for the animal. The surveys carried out among French farmers have also revealed an indirect effect on the reproduction of Scutellaria baicalensis extracts.

The natural solution tested since 2015 by the CCPA Group to limit calving stress in cattle is an original approach, complementary to rationing optimisation.

Kansas University trial

A joint CCPA/Kansas State University trial was designed to measure the impact of supplementation with Scutellaria baicalensis extracts on milk production at the beginning of lactation in a group of 122 multiparous Holstein cows, as well as on markers of inflammation and metabolic functions in animals (haptaglobin, β-hydroxybutyrate [BHB] and glucose-6-phosphate [G6P]).

The effects of supplementation with Scutellaria baicalensis extracts were measured by comparing a control batch with a supplemented batch for 60 days (SBE60) after calving.

As for the results, if the SBE5 treatment did not lead to changes in milk yield and components, the SBE60 treatment increased milk production by more than four litres per day compared to the control, improved its composition (more lactose, fat and protein), while reducing the number of somatic cells (see Fig. 1 and Table 1).

In addition, the lot supplemented with Scutellaria baicalensis extracts had fewer mastitis frequencies compared to the control lot, as well as a better longevity of the animals: lower cull rate with SBE60 treatment compared to the control lot.

In conclusion, these results indicate that supplementing postpartum dairy cows with Scutellaria baicalensis extracts is effective at increasing whole lactation milk yield. ■