Organic Milk is Cream of the Crop

A new study by Newcastle University proves that organic farmers who let their cows graze as nature intended are producing better quality milk.

The Nafferton Ecological Farming Group study found that grazing cows on organic farms in the UK produce milk which contains significantly higher beneficial fatty acids, antioxidants and vitamins than their conventional 'high input' counterparts.

During the summer months, one of the beneficial fats in particular – conjugated linoleic acid, or CLA9 – was found to be 60% higher.

The results of this study into UK dairy production are published online in the Journal of Science of Food and Agriculture.

'We have known for some time that what cows are fed has a big influence on milk quality,' explained Gillian Butler, livestock project manager for the Nafferton Ecological Farming Group at Newcastle University, who led the study. 'What is different about this research is it clearly shows that on organic farms, letting cows graze naturally, using forage-based diet, is the most important reason for the differences in the composition between organic and conventional milk.

'We've shown that significant seasonal differences exist, with nutritionally desirable fatty acids and antioxidants being highest during the summer, when the cows are eating fresh grass and clover.

'As a result, our future research is focusing on how to improve the nutritional composition of milk during the winter, when cows are kept indoors and fed mainly on conserved forage.'

The study, which involved Newcastle scientists working with the Danish Institute for Agricultural Science, is part of the ongoing cross-European Quality Low Input Food project into animal health and welfare, milk quality and working towards minimizing the use of antibiotics in dairy production.

'This paper is a major milestone in the project and clearly shows that if you manage livestock naturally then it's a win-win situation for both us and them,' said Professor Carlo Leifert, project co-coordinator.

The scientists also discovered interesting results from a group of low-input farms in Wales, which are not certified organic but use very similar production methods to organic farms (the main difference was the use of some mineral fertilizer and shorter withdrawal periods after antibiotic use).

To reduce costs, these farmers calved all their cows in spring and grazed them throughout lactation, from March until November, resulting in milk being produced on an almost 100% fresh grass diet.

Milk from these non-organic farms also had significantly higher levels of nutritionally desirable fatty acids and antioxidants, which was a direct result of the extensive outdoor rearing and fresh forage intake.

'These New-Zealand type dairy systems are not common in the UK, as weather conditions in many areas of the country make it unworkable,' explained Mrs. Butler. 'Therefore, milk from these farms is not available to the public as it's mixed in with milk from conventional systems during processing.

'However, including these extremely extensive systems allowed us to clearly link the difference in milk quality to the dairy cows' diets.'

Gordon Tweddle, of Acorn Dairy in County Durham, is a local supplier of organic milk. 'We have believed for some time that organic milk is better for us and our customers tell us it tastes better,' he said. 'It is satisfying to have the scientific explanation as to why it is also nutritionally better.'

This current research confirms previous studies in the UK, which reported higher concentrations of omega 3 fatty acids in milk from organic production systems than conventional ones.

CLA, omega-3 fatty acids, vitamin E and carotenoids have all been linked to a reduced risk of cardiovascular disease and cancer. CLA is hugely popular in the US, where it is marketed as a nutritional supplement. However, synthetic supplements often contain compounds with a different chemical composition (isomer balance) than those occurring naturally in milk, resulting in an equal dose of both 'good' (i.e. CLA9, omega-3 fatty acid, vitamin E and carotenoids) and 'less desirable' fatty acids (i.e. omega-6 fatty acids and CLA10).

'Switching to organic milk provides an alternative, natural way to increase our intake of nutritionally desirable fatty acids, vitamins and antioxidants without increasing our intake of less desirable fatty acids and synthetic forms of vitamin E,' said Mrs. Butler. 'In organic milk, the omega-3 levels increase but the omega-6 does not, which helps to improve the crucial ratio between the two.'

The study involved 25 farms across the UK in two contrasting areas of the UK – South Wales and the North East. The scientists looked at three different farming systems: conventional high input, organically certified, and non-organic sustainable (low-input).

The Nafferton Ecological Farming Group at Newcastle University collected 109 milk samples from 25 commercial farms categorized into the three different production systems: conventional high input; organically certified low input; and non-organic, low input. These samples were taken in August and October in 2004 and January, March and May the following year.

The group investigated the effects of seasonal and indoor/outdoor feeding differences on the milk's fatty acid profile, and also compared individual carotenoids, stereo-isomers of alpha-tocopherol (vitamin E) or isomers of CLA. The higher levels of nutritionally desirable fatty acids found in the organic milk were CLA9, omega-3 and linolenic acid and the antioxidants/vitamins were vitamin E and carotenoids. The lower levels of undesirable fatty acids were omega-6 and CLA10.

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