Session 3 Poster 14

What is the effect of switching from a corn-based to a grass-based forage system on the contribution of dairy products to the human nutritional requirements?

L. Rey-Cadilhac[1,2], B. Martin[1]
[1] UCA, INRAE, VetAgro Sup, UMR12133 Herbivores, Route de Theix, 63122 St-Genès-Champanelle, France, [2] INRAE, Institut Agro, PEGASE, La Prise, 35590 St-Gilles, France

Grass-fed cows compared to corn-fed cows produce milk with a higher nutritional value. However, very few studies have examined the effect of switching from one forage system to another on the contribution of dairy products to meeting human nutritional requirements. The aim of this study was to characterize changes in the coverage of the population reference intakes (PRI) by dairy products at the EU scale, when moving the dairy cows from a corn-based diet to a grass-based diet (from plain or mountainous area). The contribution of dairy products to PRI coverage was calculated on the basis of EU-wide consumption data, the concentration of nutrients in dairy products according to the cows' diet and the European Food Safety Authority and World Health Organization nutritional recommendations. Switching from a corn-based diet to a grass-based diet would have no major impact on the contribution of dairy products to meeting PRI for linoleic acid, calcium, phosphorus and magnesium, or vitamins A, B2 and B12. The change in diet would however lead to a doubling in the coverage of all α-linolenic acid, EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) PRI. However, it would also double the contribution of dairy products to the maximum recommended intake for trans fatty acids, without substantially altering this contribution for saturated fatty acids. This approach will be continued with the integration of water-soluble vitamins and oligo-minerals and be extended to other animal-based products such as beef and poultry, with systems ranging from very intensive to very extensive.

Session 3 Poster 15

Relationship between milk intrinsic quality and the environmental impact of dairy farms

M. Lepoivre[1], C. Laurent[2], B. Martin[3], PM. Grollemund[4], R. Botreau[3], F. Monsallier[5], S. Hulin[6], P. Gerber[6], C. Chassard[1], M. Coppa[7]
[1] INRAE, UMR Fromages, 20 Côte de Reyne, 15000 Aurillac, France, [2] VetAgro-Sup, 89 Av. de l'Europe, 63370 Lempdes, France, [3] INRAE, UMR Herbivores, Theix, 63122 Saint-Genès-Champanelle, France, [4] CNRS, LMBP, 100, Rue de l'Egalité, 15000 Aurillac, France, [5] Chambre d'agriculture Cantal, 26 rue du 139ème Régiment d'Infanterie, 15000 Aurillac, France, [6] Pole Fromager AOP Massif Central, 20 Côte de Reyne, 15000 Aurillac, France, [7] University of Turin, DISAFA, Largo Braccini 2, 10095 Grugliasco, Italy

This study proposes a simplification of a published multi-criteria evaluation methodology for the production of milk for cheese manufacturing, focusing it on milk quality traits possibly predicted by spectroscopic analyses and CAP'2ER® diagnostics of the environmental impact of the farms. Milk quality scores were constructed by weighing health, nutritional, technological and sensory dimensions of milk quality. Environmental impact scores were constructed by combining CAP'2ER® scores in 5 dimensions: greenhouse gas emissions, eutrophication, soil acidification, space and non-renewable energies consumption and ecosystem biodiversity. The study sample included 15 dairy farms located in the French Massif Central mountains. No correlation has been established between overall milk quality and overall environmental impact scores. High scores for nutritional and biodiversity dimensions and low scores for resource consumption dimension, were associated with farms with a high proportion of grasslands in the usable agricultural area, low stocking rate and low productivity per cow. This demonstrates the importance of defining specific priority objectives, on a farm-by-farm basis, in order to drive changes in agricultural practices. The multi-criteria evaluation model tested here appeared sensitive, but it needs to be tested on a larger scale and in different contexts.