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Fatty Acids, Health and Risk Indices of Organic and Conventional Produced Milk in Southeastern Mexico

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Abstract

Changes of diet have released undesirable effects on human health related to a high ingestion of saturated fat and low consumption of fiber. The efforts to identify healthier food products to counteract this public condition are mandatory. Organic farming has probed to provide animal products with compounds that may help to maintain human health. However, in tropical conditions, scarce investigations have been carried out to demonstrate the advantages of organic compared to conventional products. We investigated fatty acid content, thrombogenic index and health promoting index of both organic (OM) and conventional (CM) milk from humid tropical southeastern Mexico. Cross-breeds (Cebu-holstein, cebu-american swiss), including ages from three to ten years, with two and eight births and weights from 400 to 600 kg were employed. OM farms were characterised by grazing on pastures ranging from free tree areas to complete forested vegetation. CM grazed on similar conditions but using standard management including grain supplement. Milk was collected manually once in the morning from January to June of 2009. Three samples were taken monthly after milking on the bulk tank. Fatty acids were quantified by GC. Thrombogenic (TI) and health promoting index (HPI) were calculated: $TI = (C14:0 + C16:0 + C18:0) / [(0.5 \text{ MUFA}) + (0.5 \text{ n-6PUFA}) + (3n-3 \text{ PUFA}) + (n-3 \text{ PUFA} / n-6 \text{ PUFA})]$. $HPI = (n-6PUFA + n-3 \text{ PUFA} + MUFA) / [(C12:0 + (4 \times C14:0) + C16:0)]$. The results were analysed using SAS ($\alpha = 0.05$). CM had larger values of SFA (63.7%) than OM (61.48%), whereas OM had larger values of MUFA (34.3%) than CM (31.7%). PUFA showed an inverse trend for SFA and MUFA i.e. PUFA was larger in CM (4.6%) than in OM (4.1%). However, for CLA (C18:2 cis-9,trans-11) no differences were observed (1.09 and 1.14% for OM and CM, respectively). SFA in OM increased from January to June. In contrast, PUFA and CLA in OM tended to be lower as the year advanced. MUFA were steady throughout the sampling period. TI was higher (less healthier) from March to May. In agreement, HPI had the smallest (less healthier) value in April and May. Both OM and CM provide considerable amounts of desirable fatty acids; however it would be prudent to increase their concentration in both milks for human health benefits.

Keywords: CLA, fatty acid, human health, organic milk, sustainability