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Exploring differences in Western Australian milk quality and nutrition

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Consumers have shown increased interest in functional milk products that promote health and prevent disease.(1) Milk fat has an important nutritional role.(2) The purpose of this study (part of an Innovation Connections Grant with Bannister Downs Dairy) was to determine if quality or nutritional differences exist in milk processed in WA. Six different WA retail pasteurised whole milk products were provided by six dairy manufacturers and collected from two local supermarkets in March and September 2022. Milk composition was analysed using the Milkoscan FT1 (Foss, Hillerod, Denmark) for fat, protein, lactose and solids-non-fat (SNF) content. The separation and quantification of fatty acids (FAs) were performed using gas chromatography-mass spectrometry (GC-MS) (Agilent 7890 GC system fitted with a mass spectrometer detector (MSD) and a capillary column (30 m × 250 μm × 0.25 μm, DB-5 ms, Agilent). Whole milk colour measurements were measured using a BYK spectroguide handheld spectrophotometer to measure CIE L^*, a^*, b^*. A discrimination test (Triangle test) was used to determine whether sensory differences existed between the different milk samples. Milkoscan protein, lactose and solids-non-fat (SNF) results were not significantly different between dairy manufacturers ($p > 0.05$) and one dairy manufacture's fat content (3.5%) was significantly higher than the others ($p < 0.05$). All dairy manufactures results matched their product nutritional panel. Fat content was 3.1–3.5%, protein content was 3.2–3.4%, lactose content was 4.6–4.8% and SFN content was 8.7–9.1%. Principal component analysis (PCA) showed significant difference in concentration of medium-chain fatty acids (MCFA) and long-chain fatty acids (LCFA) between WA milk samples. The level of MCFA ranged from 10.1% to 12.1% of the total identified fatty acids (FAs) determined and were predominantly C12:0 and C10:0. The level of LCFA ranged from 87.9% to 89.9% of total identified FAs. The C16:0 and C18:1 (8-octadecenoic acid) represented the majority of LCFA. PCA showed three significantly different groups. Colour was significantly different ($p < 0.05$). L^* whiteness/brightness range was 43.2 to 70.6, a^* greenness/redness range was −5.6 to +2 respectively, b^* yellowness range was +1.6 to +5.9. Preliminary sensory evaluation results showed consumers ($n = 23$) could identify differences in milk colour and flavour ($p < 0.05$). Fatty acid profiles and sensory characteristics were significantly different between whole milk samples produced from different WA processors. The present study provides valuable information of FA composition in commercial milk for potentially developing alternative dietary fat sources and contributing to human health.

References

1. Nguyen D, Busetti F, Johnson FK, *et al.* (2015) *J Food Compost Anal* **44**, 102–110.
2. Gómez-Cortés P, Juarez M & de la Fuente MA (2018) *Trends Food Sci Technol* **81**, 1–9.