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***In vitro* and *in vivo* anti-inflammatory activity of bovine milk fat globule (MFGM)-derived Complex lipid fractions**

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Background: Many beneficial health properties including anti-inflammatory activity have been reported for the bovine milk fat globule membrane (MFGM) or components thereof. Here we present novel data on the in-vitro and in-vivo anti-inflammatory activity of proprietary MFGM preparations which confirm and extend the concept of MFGM as a dietary anti-inflammatory agent.

Methods: The aim of this study was to present new data on the in-vitro and in-vivo anti-inflammatory activity of proprietary MFGM preparations. Results from an array of cell-based assays, in which MFGM preparations were tested for their ability to modulate levels of the inflammatory mediators IL-1 β , nitric oxide, superoxide anion, cyclo-oxygenase-2, and neutrophil elastase, were collated. Representative estimates of anti-inflammatory activity of MFGM preparations at different dose levels were obtained by combining results from several experiments, firstly converting sample results to %Control and then pooling the results using weighted means. Significance of the pooled results was evaluated using the Student t-test. For the in-vivo trials, rats were fed MFGM preparations for

two weeks prior to induction of either adjuvant-arthritis or carrageenan-induced acute inflammation. Inflammation was monitored using foot score and foot volume measures. Results were statistically evaluated using the method employed for in-vitro data.

Results: In-vitro MFGM and some of its isolated fractions displayed broad spectrum inhibitory activity against the inflammatory mediators, although activity was highest against Interleukin-1 β . Two MFGM phospholipid preparations were effective in reducing adjuvant-induced paw swelling in rats (MFGM 1, foot score $p=0.02$; MFGM 2, foot score $p=0.001$, foot volume $p=0.007$), while there was a tendency for a different MFGM preparation to reduce carrageenan-induced rat paw oedema (foot volume, $p=0.072$).

Conclusions: These results confirm the potential of MFGM as a nutritional intervention in mitigation of chronic and acute inflammatory conditions, especially those involved in joint disease, and as a nutritional supplement for general immune regulation.

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