THE FLAVOUR OF NEW ZEALAND
WHOLE MILK POWDER

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fulfilment of the requirements for
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Results of this investigation indicate that there are certain fundamental differences in the flavour of New Zealand WMP as opposed to European (Danish) WMP. Sensory analysis has highlighted that this difference is evident in the scores which panellists give for the lactone attribute.

This difference in sensory evaluation can be directly linked to differences in the lactone profiles from New Zealand and Danish WMP. Danish WMP consistently contains the two gamma lactones \( \gamma \)-Dodecalactone and \( \gamma \)-Dodec-cis-6-enolactone at levels greater than or equal to their flavour threshold values. While these two lactones are generally absent from New Zealand WMP.

The presence of \( \gamma \)-Dodecalactone and \( \gamma \)-Dodec-cis-6-enolactone in WMP has been demonstrated to be related to the diet of the cow. By the addition of a grain concentrate consisting of 85% oats, 10% sunflower seeds and 5% barley it was possible to increase the levels of \( \gamma \)-Dodecalactone and \( \gamma \)-Dodec-cis-6-enolactone to the point where the sensory panel was able to differentiate WMP’s in respect to the presence or absence of these compounds.

There is the inference that the presence of the gamma lactones in WMP is also a function of dairy breed with Friesian cows showing a greater capacity than Jersey or mixed Jersey/Friesian cows to produce these flavour compounds. Also diet may be an important factor with the lipid content and fatty acid composition having an influencing the level of gamma lactones produced.

Analysis of the flavour volatiles from fresh New Zealand milkfat has indicated a possible causative role for terpenoid compounds in the distinctive "green/grassy" flavours often present. In particular such compounds as D-Limonene have been shown to be present in samples of New Zealand milkfat and when added to New Zealand milkfat has a tendency to increase the "green/grassy" flavour score. However this does not discount the contribution of compounds such as hexanal which was also detected in New Zealand milkfat.
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