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THE FLAVOUR OF NEW ZEALAND  
WHOLE MILK POWDER

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RUSSELL DOUGLAS WILSON

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## ABSTRACT

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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## TABLE OF CONTENTS

ABSTRACT .....	ii
ACKNOWLEDGEMENTS .....	iii
TABLE OF CONTENTS .....	iv
LIST OF TABLES .....	x
LIST OF FIGURES .....	xiii
LIST OF APPENDICES .....	xiv
CHAPTER I: INTRODUCTION .....	1
CHAPTER II: REVIEW OF LITERATURE .....	3
2.0 Introduction .....	4
2.1 The Chemical Composition of Flavour .....	4
2.1.1 Lactones .....	5
2.1.1.1 Effect of diet on the level of lactones in milkfat .....	10
2.1.1.2 Mechanisms for the formation of $\gamma$ -Lactones .....	10
2.1.1.3 Lactones in Milkfat .....	13
2.1.2 Methyl Ketones .....	13
2.1.3 Fatty acids .....	16
2.1.4 Hydrocarbons .....	17
2.2 Effect of Feed on the Flavour of Dairy Products .....	18
2.3 Off-flavours in milk .....	19
2.3.1 Transmitted flavours. ....	19
2.3.2 Feed Flavours. ....	20

2.3.2.1 Silage. ....	21
2.3.2.2 Weed Flavours ....	21
2.3.3 Microbial ....	23
2.4 Off-flavours of whole milk powder ....	23
2.4.1 Effect of Lipid Oxidation on the Flavour of Whole Milk Powder ....	24
2.5 Heat Induced Flavours in Milk ....	26
2.6 Isolation of Volatiles from Dairy Products ....	27
2.6.1 Vacuum Distillation ....	28
2.6.2 Analysis of Flavour Volatiles from Dairy Products ....	29
2.6.3 Analysis of Volatiles using the Gas Chromatographic Sniffing Technique. ....	29
2.7 Summary. ....	30
CHAPTER III. MATERIALS AND METHODS ....	31
3.1 MATERIALS ....	32
3.2 METHODS ....	32
3.2.1 WMP Specification. ....	32
3.2.2 WMP Manufacture. ....	32
3.2.2.1 Evaporation. ....	32
3.2.2.2 Homogenisation. ....	33
3.2.2.3 Spray Drying. ....	33
3.2.2.4 Packaging and Storage. ....	33
3.2.3 Analysis of WMP. ....	34
3.2.3.1 Total Solids of Whole Milk Concentrate. ....	34
3.2.3.2 Moisture. ....	34
3.2.3.3 Fat Content. ....	34
3.2.3.4 Solubility Index. ....	34
3.2.3.5 Whey Protein Nitrogen Index (WPNI). ....	34
3.2.3.6 Titratable Acidity. ....	35

3.2.4 Flavour Evaluation. ....	35
3.2.4.1 Sample Preparation. ....	35
3.2.4.2 Evaluation. ....	35
3.2.4.3 Informal Flavour Evaluation. ....	36
3.2.5 Extraction of Lipid from WMP. ....	36
3.2.5.1 Isolation of Lactones from Milkfat. ....	36
3.2.5.2 Determination of Lactone Potential. ....	37
3.2.5.3 Gas Liquid Chromatography of Lactones. ....	37
3.2.5.4 Mass Spectral Analysis of Lactones. ....	37
3.2.5.5 Quantification of Lactones. ....	38
3.2.6 Grain Concentrate Feeding of Dairy Cows. ....	38
3.2.6.1 Trial 1 - (September - December 1987). ....	38
3.2.6.2 Trial 2 - (September - November 1988). ....	38
3.2.7 Determination of the Lipid Content of the Feed Grains. ....	39
3.2.7.1 Fatty Acid Analysis of Lipid from Grains. ....	39
3.2.8 Vacuum Distillation. ....	39
3.2.8.1 Vacuum Distillation of Whole Milk Powder. ....	40
3.2.8.2 Vacuum Distillation of Milkfat. ....	40
3.2.8.3 Effectiveness of the Vacuum Distillation of Dairy Products. ....	40
3.2.9 Mass Spectral Analysis of Vacuum Distillates. ....	41

CHAPTER IV. RESULTS .....	42
4.1 Manufacture of Whole Milk Powder. ....	43
4.2 Sensory Analysis of New Zealand and European Whole Milk Powder. ..	43
4.3 Identification of lactones. ....	43
4.3.1 Lactone Content of New Zealand Whole Milk Powder. ....	43
4.3.2 Lactone Content of European (Danish) Whole Milk Powder. ..	50
4.4 Effect of Diet on the Flavour of New Zealand Whole Milk Powder. ...	50
4.4.1 The effect of concentrate feeding on the sensory evaluation of	

New Zealand WMP (Trial 1, 1987). . . . .	53
4.4.1.1 Effect of Feed Type. . . . .	53
4.4.1.2 The Effect of Season. . . . .	58
4.4.1.3 The Effect of Storage Temperature. . . . .	58
4.4.1.4 Interaction effects. . . . .	58
4.4.2. The effect of concentrate feeding on the lactone content of New Zealand WMP (Trial 1, 1987). . . . .	59
4.5 Effect of herd type on the flavour of New Zealand WMP. . . . .	61
4.6. The Effect of Supplementing pasture feeding with grain concentrates on the flavour of New Zealand Whole Milk Powder (Trial 2, 1988). . . . .	66
4.6.1. Sensory analysis of WMP . . . . .	66
4.6.2 The effect of concentrate feeding on the lactone content of New Zealand WMP (Trial 2, 1988). . . . .	67
4.7. Lipid content of grains used in the Feeding Trials. . . . .	71
4.8. Flavour volatiles from New Zealand milkfat. . . . .	73
4.8.1. Effectiveness of the vacuum distillation of New Zealand milkfat. . . . .	73
4.9 The effect of terpenes on the flavour of New Zealand milkfat . . . . .	77
4.9.1 D-Limonene . . . . .	77
4.9.2 Other Terpenoids . . . . .	77
CHAPTER V: DISCUSSION . . . . .	79
5.1 Manufacture of Whole Milk Powder . . . . .	80
5.2 Sensory Analysis of Whole Milk Powder . . . . .	80
5.2.1 Sensory Analysis of New Zealand and European WMP . . . . .	81
5.3 Lactone Analysis of Whole Milk Powder . . . . .	81
5.3.1 Lactone Analysis of New Zealand and Danish WMP . . . . .	82
5.4 Possible Origins of Gamma Lactones in Danish Whole Milk Powder . . . . .	84



5.5 The Effect of Concentrate Feeding on the Flavour of New Zealand WMP	
(Trial 1) .....	85
5.5.1 Sensory Analysis of WMP .....	85
5.5.2 Lactone Analysis of WMP .....	86
5.5.3 The Effect of Concentrate Feeding on Milk Production and Gross Milk Composition .....	87
5.6 Other Factors which may have Influenced the Initial Trial and Reasons for the Changes Incorporated in the Second Trial .....	87
5.6.1 Breed of Cow .....	88
5.6.2 Lactational Effects .....	88
5.6.3 Composition of Feed .....	89
5.7 The Effect of Supplementing Pasture Feeding with Grain Concentrates on the Flavour of New Zealand WMP (Trial 2) .....	90
5.7.1 Sensory Analysis of WMP .....	90
5.7.2 Lactone Analysis of WMP (Trial 2) .....	91
5.8 The Effect of Diet on the Flavour of New Zealand WMP .....	92
5.8.1 Influence of Breed of Dairy Cow .....	92
5.8.2 The Influence of Time .....	93
5.9 The Effects of Grain Feeding on Rumen Fermentation .....	93
5.9.1 The Effect of Ruminal Microfloral Changes on the Production of Lactones .....	94
5.10 The Effect of Grain Feeding on the Flavour Composition of New Zealand WMP .....	94
5.11 Green/grassy Flavour of New Zealand .....	95
5.11.1 Sensory Analysis of Milkfat Products .....	95
5.12 Effectiveness of the Vacuum Distillation of New Zealand Milkfat ....	95
5.13 Volatile Compounds in New Zealand Milkfat (FFMR) .....	96
5.14 Classes of Compounds Present in New Zealand Milkfat (FFMR) .....	97
5.14.1 Hydrocarbons .....	97

	ix
5.14.2 Aldehydes .....	97
5.14.3 Methyl Ketones .....	98
5.14.4 Fatty Acids .....	99
5.14.5 Alcohols .....	99
5.14.6 Lactones .....	99
5.14.7 Terpenoids .....	99
5.15 Flavour Properties of the Terpenoids Identified in New Zealand Milkfat (FFMR) .....	100
5.16 The Effect of Terpenes on the Flavour of New Zealand Milkfat .....	100
5.17 Origins of Terpenes in New Zealand Milkfat .....	101
CHAPTER VI: CONCLUSIONS .....	102
REFERENCES .....	105

## LIST OF TABLES

Table 2.1 Level of $\delta$ and $\gamma$ Lactones Isolated from Butterfat (ppm).	7
Table 2.2 Seasonal Variation of Lactone Levels in Bovine Milkfat.	8
Table 2.3 Influence of Stage of Lactation on Lactone Levels in Bovine Milkfat.	8
Table 2.4 Effect of Dairy Breed on Lactone Concentration.	9
Table 2.5 Influence of Ketosis on the Lactone Levels of Milkfat.	9
Table 2.6 Flavour Character and Threshold Levels of Selected Aliphatic Aldehydes.	17
Table 2.7 Volatile Compounds Regularly Detected in Feed Flavoured Milk.	20
Table 2.8 Transmission of Flavour Substances to Milk.	22
Table 2.9 Compounds Contributing to Typical Oxidation Flavours.	25
Table 4.1 Summary of Mean Sensory Scores and F-Ratios of New Zealand and Danish Whole Milk Powder.	44
Table 4.2 Lactone Content of New Zealand Whole Milk Powder (Specification 8000).	51
Table 4.3 Lactone Content of European Whole Milk Powder (Danish).	52
Table 4.4. Treatment means showing the effect of feed type (pasture or pasture supplemented with grain concentrates) on the flavour attributes of New Zealand WMP	54
Table 4.5. Summary of F-ratios showing the effect of season, feed type, temperature and time on New Zealand WMP (Trial 1).	55
Table 4.6. Summary of F-ratios showing interactions between season, feed type, temperature and time on New Zealand WMP (Trial 1).	56
Table 4.7. Treatment means showing the effect of feed type (pasture or pasture supplemented with grain concentrates) on the flavour attribute "Age-related" of New Zealand WMP (November 1987).	57
Table 4.8. Treatment means showing the effect of feed type (pasture or pasture supplemented with grain concentrates) on the flavour attributes of New Zealand WMP (December 1987).	57
Table 4.9 Treatment means showing interaction between season and time of storage	

for the attribute "lactone" (Trial 1, 1987).

59

Table 4.10. Effect of supplementing pasture feeding with grain concentrates on the level of free lactones and the level of lactone potential of NZ WMP (Trial 1, 1987).

60

Table 4.11. Summary of F-ratios showing effect of herd type, storage temperature and storage time on New Zealand WMP (Udy Trial, August 1987).

62

Table 4.12. Mean sensory scores showing the effect of herd type on the flavour attributes of New Zealand WMP (August 1987).

63

Table 4.13. Summary of F-ratios from the Sensory evaluation of WMP manufactured from milk obtained from mixed breed herds (Manawatu Co-op) and pedigree Friesian herd (Udy) showing the effect of herd type, temperature and storage time and the interaction of these effects (November 1987).

64

Table 4.14. Mean sensory scores showing the effect of herd type on the flavour attributes of New Zealand WMP (Udy Trial, November 1987).

65

Table 4.15. Mean sensory scores showing the effect of time on the Lactone flavour attribute.

66

Table 4.16. Summary of F-ratios showing the effect of feed type, storage time and storage time on New Zealand Whole Milk Powder (Trial 2, 1988).

69

Table 4.17. Summary of mean sensory scores showing the effect of feed type on the sensory attributes of New Zealand Whole Milk Powder (Trial 2, 1988).

71

Table 4.18. Interaction means showing the effect of feed type and storage time on the "lactone" flavour attribute of New Zealand Whole Milk Powder (Trial 2, 1988).

70

Table 4.19. Effect of grain feeding on the level of lactones in NZ WMP (Trial 2).

71

Table 4.20 Fatty acid compositions obtained from the grains used in grain feeding trials 1 and 2.

72

Table 4.21 Compounds identified by GC/MS analysis of the extract from the vacuum distillation of New Zealand milkfat (FFMR).

74

Table 4.22 The effect on the level of "green/grassy" flavour in New Zealand milkfat by the addition of the aqueous vacuum distillate from 4 Kg of New Zealand

milkfat. Mean scores using the informal panel (three panellists).

76

Table 4.23 The effect of the addition of D-limonene on the flavour of New Zealand milkfat.

77

Table 4.24 The effect of the addition of selected terpenoids on the flavour of New Zealand milkfat.

78

Table 5.1. Flavour properties of the terpenoids from New Zealand milkfat (FFMR).

101



## LIST OF FIGURES

Figure 2.1 Mechanism of Lactone Formation in Milkfat.	6
Figure 2.2 Suggested Mechanism for the Formation of $\gamma$ -Dodec- <i>cis</i> -6-enolactone.	11
Figure 2.3 Suggested Mechanism for the Formation of $\gamma$ -Dodecalactone.	11
Figure 2.4 Mechanism for the Formation in Methyl Ketones in Milkfat (Kinsella, <u>et al.</u> , 1967).	15
Figure 4.1. Electron Impact (70 eV) mass spectrum of $\gamma$ -Dodecalactone and $\delta$ -Dodecalactone.	45
Figure 4.2 Gas chromatographic separation of lactone extracts from New Zealand whole milk powder.	46
Figure 4.3 Gas chromatography/mass spectrometry and mass chromatography analysis of lactone extracts from New Zealand whole milk powder.	47
Figure 4.4 Gas chromatographic separation of lactone extracts from Danish whole milk powder.	48
Figure 4.5 Gas chromatography/mass spectrometry and mass chromatography analysis of lactone extracts from Danish whole milk powder.	49

## LIST OF APPENDICES

APPENDIX 1 Questionnaire Used in Whole Milk Powder Evaluations	113
APPENDIX 2 Definitions of Sensory Terms Used in the Evaluation of Whole Milk Powder.	114
APPENDIX 3 The effect of grain Feeding on the flavour of New Zealand WMP (Trial 1 (1987). Summary of mean sensory scores for experimental WMP (September Production).	115
APPENDIX 4 The effect of grain Feeding on the flavour of New Zealand WMP (Trial 1 (1987). Summary of mean sensory scores for experimental WMP (October Production).	116
APPENDIX 5 The effect of grain Feeding on the flavour of New Zealand WMP (Trial 1 (1987). Summary of mean sensory scores for experimental WMP (early November Production).	117
APPENDIX 6 The effect of grain Feeding on the flavour of New Zealand WMP (Trial 1 (1987). Summary of mean sensory scores for experimental WMP (late November Production).	118
APPENDIX 7 The effect of grain Feeding on the flavour of New Zealand WMP (Trial 1 (1987). Summary of mean sensory scores for experimental WMP (December Production).	119
APPENDIX 8 The effect of grain supplements on the flavour of New Zealand WMP. Summary of mean sensory scores of experimental WMP (Trial 2, 1988) - 3 month evaluation.	120
APPENDIX 9 The effect of grain supplements on the flavour of New Zealand WMP. Summary of mean sensory scores of experimental WMP (Trial 2, 1988) - 6 month evaluation.	121
APPENDIX 10 The effect of grain supplements on the flavour of New Zealand WMP. Summary of mean sensory scores of experimental WMP (Trial 2, 1988) - 9 month evaluation.	122
APPENDIX 11 The effect of grain supplements on the flavour of New Zealand WMP. Summary of mean sensory scores of experimental WMP (Trial 2, 1988)	



- 12 month evaluation.