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Ultra Filtration (UF) Process Development for
the Production of Camembert Cheese

A thesis presented in partial fulfilment of the requirements for the degree of

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in
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Ming Ho Edwin Law

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ABSTRACT

The application of UF technology in cheese production has several potential advantages; product consistency, yield, lower costs and more automation. This study investigated the effects of four processing variables in the manufacture of Camembert cheese using UF and their impact on cheese quality. Using an incomplete block design, sixteen unique treatments were produced with combined processing variables (high-fat or low-fat; brine-salted or retentate-salted; acidified to pH 5.2 or pH 4.9; set in tubular moulds and small moulds). The cheeses were matured for seven weeks at 4±1 °C and were analysed for total solids, fat, salt, non-protein nitrogen (NPN) and soluble nitrogen (SN) contents during the maturation period (seven weeks). Major defects were evaluated by experienced cheese graders in the fourth week. pH was measured and instrumental analysis was also conducted. Sensory evaluation on consumer acceptance was also conducted in the fourth week.

All the cheese samples exhibited similar increases in rind and core pH, NPN/TN and SN/TN ratios, and were generally characterised by thick rind and softness. The low-fat cheese samples had significantly lower NPN/TN ratio and higher overall acceptance in sensory evaluation. The salt content was also significantly higher. The retentate-salted cheese samples had significantly lower NPN/TN ratios and more defects in rind discolouration and deformation, and saltiness. The cheese samples acidified to pH 5.2 had significantly lower NPN/TN ratios and fewer defects in rind discolouration, softness, sourness, and bitterness. The cheese samples made using tube moulds were significantly firmer with fewer defects in rind deformation, core unevenness, and softness.

The level of fat and extent of acidification was found to have a profound effect on cheese quality, and cheeses produced with low-fat retentate and/or acidified to pH 5.2 generally had superior shelf-life with lower levels of proteolysis. The preference of the two salting methods may be debatable, but considering labour and time, retentate-salting is preferable. Tube mould generally produced better cheese with fewer defects.
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# TABLE OF CONTENTS

ABSTRACT .......................................................................................................................... i

ACKNOWLEDGEMENTS ................................................................................................. ii

TABLE OF CONTENTS ................................................................................................. iii

LIST OF TABLES .............................................................................................................. vi

LIST OF FIGURES .......................................................................................................... vii

LIST OF ABBREVIATIONS ............................................................................................. xiii

1. INTRODUCTION ......................................................................................................... 1

2. LITERATURE REVIEW .............................................................................................. 3
   2.1. Introduction ........................................................................................................ 3
   2.2. Cheese ............................................................................................................... 4
       2.2.1. Types of cheeses ..................................................................................... 5
   2.3. Advances in the dairy industry ....................................................................... 7
       2.3.1. Membrane technology .......................................................................... 7
       2.3.2. Principles of membrane filtration ......................................................... 8
       2.3.3. Pressure-driven membrane processes ................................................. 9
       2.3.4. Microfiltration ....................................................................................... 9
       2.3.5. Ultrafiltration ...................................................................................... 10
       2.3.6. Nanofiltration and reverse osmosis ..................................................... 10
       2.3.7. Application of membrane technology in cheese ............................... 11
       2.3.8. Characteristics of cheeses manufactured using membrane processes ... 11
       2.3.9. Major approaches in cheese-making using membrane processes ...... 12
   2.4. Camembert cheese ............................................................................................. 14
       2.4.1. Composition, properties and standards .............................................. 15
       2.4.2. Manufacturing of Camembert ............................................................... 15
       2.4.3. UF in Camembert cheese-making ....................................................... 17
   2.5. Cheese ripening and quality ........................................................................... 18
       2.5.1. Effects of lactic fermentation ............................................................... 18
       2.5.2. Proteolysis ......................................................................................... 19
       2.5.3. Lipolysis ........................................................................................... 22
2.5.4. Flavour development ................................................................. 23
2.5.5. Texture development ................................................................. 26
2.6. Analysis of cheese ........................................................................ 26
  2.6.1. Determination of pH ................................................................. 26
  2.6.2. Total solids ............................................................................. 27
  2.6.3. Salt content ............................................................................. 27
  2.6.4. Fat content ............................................................................. 27
  2.6.5. Nitrogen content ................................................................. 28
  2.6.6. Texture analysis ................................................................. 28
  2.6.7. Sensory analysis ......................................................... 29
  2.6.8. Microbiological analysis ........................................ 30
2.7. Conclusions ............................................................................. 31

3. MATERIALS AND METHODS .................................................. 32
  3.1. Experimental design ..................................................................... 32
    3.1.1. Description of processing variables .................................. 33
  3.2. Production of Camembert ............................................................. 34
  3.3. Analysis of nitrogen fractions ...................................................... 42
  3.4. Measurement of pH ............................................................... 43
  3.5. Determination of total solids ...................................................... 44
  3.6. Determination of fat content ...................................................... 44
  3.7. Determination of salt content ...................................................... 45
  3.8. Instrumental analysis ............................................................... 45
  3.9. Cheese grading ........................................................................ 46
  3.10. Consumer acceptance ............................................................ 47
  3.11. Microbiological analysis ......................................................... 48
  3.12. Statistical analysis of data ...................................................... 48

4. RESULTS .................................................................................... 49
  4.1. Change in total solids ............................................................... 49
  4.2. Salt content ............................................................................. 55
  4.3. Fat content ............................................................................. 56
  4.4. Changes in pH levels ............................................................. 58
  4.5. Level of proteolysis ................................................................. 64
Ultra Filtration (UF) Process Development for the Production of Camembert Cheese

Ming Ho Edwin Law
LIST OF TABLES

Table 3.1: Incomplete block design of sixteen unique treatments for the manufacture of Camembert cheese .................................................................................................................. 32

Table 3.2: A list of attributes used in cheese grading and the total scores given in each subgroup...................................................................................................................................... 47

Table 4.1: p-values (p ≤ 0.05) for total solids within each type of treatment. .......... 49

Table 4.2: p-values (p ≤ 0.05) for salt and fat levels within each type of treatment.... 56

Table 4.3: p-values (p ≤ 0.05) for core pH within each type of treatment............. 59

Table 4.4: p-values (p ≤ 0.05) for NPN/TN ratios within each type of treatment. ..... 64

Table 4.5: p-values (p ≤ 0.05) for SN/TN ratios within each type of treatment. ....... 70

Table 4.6: Mean scores and standard deviations of the combined of the five sensory attributes........................................................................................................................ 85

Table 4.7: p-values (p ≤ 0.05) of the four processing variables of the five sensory attributes ................................................................................................................................... 85

Table 5.1: Examples of important flavour components in Camembert cheese (Fox et al., 2004). ............................................................................................................................ 108
LIST OF FIGURES

Figure 2.1: Manufacturing protocol for Camembert cheese (Walstra et al., 2006). ....16

Figure 2.2: Overview of general protein conversion pathways for flavour formation in cheese (Walstra et al., 2006). ................................................................. 24

Figure 2.3: Formation of flavour compounds from fat in cheese (Walstra et al., 2006). ................................................................. 25

Figure 3.1: Set-up of the four processing variables applied to four treatments per block of Camembert cheese production......................................................... 36

Figure 3.2: A small batch of retentate (80 L) was separated from the main batch to carry out trial experiment with four treatments (20L each). .............................. 36

Figure 3.3: A pour tank with pump which circulates and allows the mixing of retentate with other ingredients. The pre-cheese retentate was then pumped into different moulds......................................................... 37

Figure 3.4: Small silicone tray moulds containing pre-cheese retentate. ..................... 37

Figure 3.5: Tube moulds containing pre-cheese retentate in plastic films. ............... 38

Figure 3.6: Wire cutter used for slicing young cheese logs removed from tube moulds into approximately 125 g units. ................................................................. 38

Figure 3.7: Individual young Camembert cheeses loaded onto metal racks.......... 39

Figure 3.8: Brine tank used to immerse young cheeses. Stirring of the excess salt at the bottom of the tank was done prior to the immersion of the young cheeses, which ensures the salinity is above 95%. ............................................ 39

Figure 3.9: Process flow chart of Camembert cheese production using ultrafiltration, from milk reception to culture addition. ......................................................... 40

Figure 3.10: Process flow chart of Camembert cheese production using ultrafiltration, continuing from culture addition to the finished product. (*) represents process variables which were manipulated ................................................................. 41

Figure 4.1: Changes in total solids (TS) (mean ± SE_M) of low-fat (n = 32) and high-fat (n = 16) Camembert cheese stored at 4 ± 1 °C for six weeks post-packaging .......... 51

Figure 4.2: Changes in total solids (TS) (mean ± SE_M) of brine-salted (n = 24) and retentate-salted (n = 16) Camembert cheese stored at 4 ± 1 °C for six weeks post-packaging. ................................................................. 51
Figure 4.3: Changes in total solids (TS) (mean ± SE_M) of Camembert cheese acidified to pH 5.2 (n = 24) and pH 4.9 (n = 24). The samples were stored at 4 ± 1 °C for six weeks post-packaging. ................................................................. 52

Figure 4.4: Changes in total solids (TS) (mean ± SE_M) of Camembert cheese made using tube moulds (n = 24) and small moulds (n = 24). The samples were stored at 4 ± 1 °C for six weeks post-packaging. .................................................................................. 52

Figure 4.5: Changes in total solids (TS) (mean ± SE_M) of Camembert cheese for low-fat brine-salted samples (n = 4 in each treatment). The samples were stored at 4 ± 1 °C for six weeks post-packaging. .................................................................................. 53

Figure 4.6: Changes in total solids (TS) (mean ± SE_M) of Camembert cheese for low-fat retentate-salted samples (n = 4 in each treatment). The samples were stored at 4 ± 1 °C for six weeks post-packaging. .................................................................................. 53

Figure 4.7: Changes in total solids (TS) (mean ± SE_M) of Camembert cheese for high-fat brine-salted samples (n = 4 in each treatment). The samples were stored at 4 ± 1 °C for six weeks post-packaging. .................................................................................. 54

Figure 4.8: Changes in total solids (TS) (mean ± SE_M) of Camembert cheese for high-fat retentate-salted samples (n = 4 in each treatment). The samples were stored at 4 ± 1 °C for six weeks post-packaging. .................................................................................. 54

Figure 4.9: Combined mean of salt content (mean ± SE_M) in Camembert cheese samples for each treatment: high-fat (n = 32) and low-fat (n = 32); brine-salted (n = 32) and retentate-salted (n = 32); final acidification pH of 5.2 (n = 32) and pH 4.9 (n = 32); and tube mould (n = 32) and small mould (n = 32). Samples were analysed in the first week post-packaging. .................................................................................. 55

Figure 4.10: Salt content (mean ± SE_M) in Camembert cheese samples of sixteen treatments (n = 4 in each treatment) analysed in the first week post-packaging. ........ 56

Figure 4.11: Combined mean of fat content (mean ± SE_M) in Camembert cheese samples for each treatment: low-fat (n = 16) and high-fat (n = 16); brine-salted (n = 16) and retentate-salted (n = 16); final acidification pH of 5.2 (n = 16) and pH 4.9 (n = 16); and tube mould (n = 16) and small mould (n = 16). Samples were analysed in the first week post-packaging. .................................................................................. 57

Figure 4.12: Fat content (mean ± SE_M) in Camembert cheese samples of sixteen treatments (n = 4 in each treatment) analysed in the first week post-packaging. ........ 57

Figure 4.13: Changes in the core and rind pH (mean ± SE_M) of low-fat (n = 64) and high-fat (n = 32) Camembert cheese stored at 4 ± 1 °C for six weeks post-packaging. .................................................................................. 60

Figure 4.14: Changes in the core and rind pH (mean ± SE_M) of brine-salted (n = 48) and retentate-salted (n = 48) Camembert cheese stored at 4 ± 1 °C for six weeks post-packaging. .................................................................................. 60
Figure 4.15: Changes in the core and rind pH (mean ± SE_M) of Camembert cheese acidified to pH 5.2 (n = 48) and pH 4.9 (n = 48). The samples were stored at 4 ± 1 ºC for six weeks post-packaging. .......................................................... 61

Figure 4.16: Changes in the core and rind pH (mean ± SE_M) of Camembert cheese made using tube moulds (n = 48) and small moulds (n = 48). The samples were stored at 4 ± 1 ºC for six weeks post-packaging. .......................................................... 61

Figure 4.17: Changes in the core and rind pH (mean ± SE_M) of Camembert cheese for low-fat brine-salted samples (n = 8 in each treatment). The samples were stored at 4 ± 1 ºC for six weeks post-packaging. .......................................................... 62

Figure 4.18: Changes in the core and rind pH (mean ± SE_M) of Camembert cheese for low-fat retentate-salted samples (n = 8 in each treatment). The samples were stored at 4 ± 1 ºC for six weeks post-packaging. .......................................................... 62

Figure 4.19: Changes in the core and rind pH (mean ± SE_M) of Camembert cheese for high-fat brine-salted samples (n = 8 in each treatment). The samples were stored at 4 ± 1 ºC for six weeks post-packaging. .......................................................... 63

Figure 4.20: Changes in the core and rind pH (mean ± SE_M) of Camembert cheese for high-fat retentate-salted samples (n = 8 in each treatment). The samples were stored at 4 ± 1 ºC for six weeks post-packaging. .......................................................... 63

Figure 4.21: Changes in the NPN/TN ratios (mean ± SE_M) of low-fat (n = 32) and high-fat (n = 16) Camembert cheese stored at 4 ± 1 ºC for seven weeks post-packaging. .......................................................... 66

Figure 4.22: Changes in the NPN/TN ratio (mean ± SE_M) of brine-salted (n = 24) and retentate-salted (n = 24) Camembert cheese stored at 4 ± 1 ºC for seven weeks post-packaging. .......................................................... 66

Figure 4.23: Changes in the NPN/TN ratio (mean ± SE_M) of Camembert cheese acidified to pH 5.2 (n = 24) and pH 4.9 (n = 24). The samples were stored at 4 ± 1 ºC for seven weeks post-packaging. .......................................................... 67

Figure 4.24: Changes in the NPN/TN ratio (mean ± SE_M) of Camembert cheese made using tube moulds (n = 24) and small moulds (n = 24). The samples were stored at 4 ± 1 ºC for seven weeks post-packaging. .......................................................... 67

Figure 4.25: Changes in the NPN/TN ratio (mean ± SE_M) of Camembert cheese for low-fat brine-salted samples (n = 4 in each treatment). The samples were stored at 4 ± 1 ºC for seven weeks post-packaging. .......................................................... 68

Figure 4.26: Changes in the NPN/TN ratio (mean ± SE_M) of Camembert cheese for low-fat retentate-salted samples (n = 4 in each treatment). The samples were stored at 4 ± 1 ºC for seven weeks post-packaging. .......................................................... 68
Figure 4.27: Changes in the NPN/TN ratio (mean ± SEM) of Camembert cheese for high-fat brine-salted samples (n = 4 in each treatment). The samples were stored at 4 ± 1 °C for seven weeks post-packaging. .................................................. 69

Figure 4.28: Changes in the NPN/TN ratio (mean ± SEM) of Camembert cheese for high-fat retentate-salted samples (n = 4 in each treatment). The samples were stored at 4 ± 1 °C for seven weeks post-packaging. .................................................. 69

Figure 4.29: Changes in the SN/TN ratio (mean ± SEM) of low-fat (n = 32) and high-fat (n = 16) Camembert cheese stored at 4 ± 1 °C for seven weeks post-packaging. .................................................. 72

Figure 4.30: Changes in the SN/TN ratio (mean ± SEM) of brine-salted (n = 24) and retentate-salted (n = 24) Camembert cheese stored at 4 ± 1 °C for seven weeks post-packaging. .................................................. 72

Figure 4.31: Changes in the SN/TN ratio (mean ± SEM) of Camembert cheese acidified pH 5.2 (n = 24) and pH 4.9 (n = 24). The samples were stored at 4 ± 1 °C for seven weeks post-packaging. .................................................. 73

Figure 4.32: Changes in the SN/TN ratio (mean ± SEM) of Camembert cheese made using tube moulds (n = 24) and small moulds (n = 24). The samples were stored at 4 ± 1 °C for seven weeks post-packaging. .................................................. 73

Figure 4.33: Changes in the SN/TN ratio (mean ± SEM) of Camembert cheese for low-fat brine-salted samples (n = 4 in each treatment). The samples were stored at 4 ± 1 °C for seven weeks post-packaging. .................................................. 74

Figure 4.34: Changes in the SN/TN ratio (mean ± SEM) of Camembert cheese for low-fat retentate-salted samples (n = 4 in each treatment). The samples were stored at 4 ± 1 °C for seven weeks post-packaging. .................................................. 74

Figure 4.35: Changes in the SN/TN ratio (mean ± SEM) of Camembert cheese for high-fat brine-salted samples (n = 4 in each treatment). The samples were stored at 4 ± 1 °C for seven weeks post-packaging. .................................................. 75

Figure 4.36: Changes in the SN/TN ratio (mean ± SEM) of Camembert cheese for high-fat retentate-salted samples (n = 4 in each treatment). The samples were stored at 4 ± 1 °C for seven weeks post-packaging. .................................................. 75

Figure 4.37: Change in force (N) (mean ± SEM) at 50% deformation for low-fat brine-salted cheese samples (n = 8 in each treatment) stored at 4 ± 1 °C for six weeks post-packaging. .................................................. 77

Figure 4.38: Change in force (N) (mean ± SEM) at 50% deformation for low-fat retentate-salted cheese samples (n = 8 in each treatment) stored at 4 ± 1 °C for six weeks post-packaging. .................................................. 77

Figure 4.39: Change in force (N) (mean ± SEM) at 50% deformation for high-fat brine-salted cheese samples (n = 8 in each treatment) stored at 4 ± 1 °C for six weeks post-packaging. .................................................. 78
Figure 4.40: Change in force (N) (mean ± SE_M) at 50% deformation for high-fat retentate-salted cheese samples (n = 8 in each treatment) stored at 4 ± 1 °C for six weeks post-packaging. .............................................................. 78

Figure 4.41: Percentage of occurrence in nine major sensory defects for high-fat (n = 8) and low-fat (n = 8) Camembert cheese at the age of four weeks. The samples were stored at 4 ± 1 °C post-packaging. .............................................................. 82

Figure 4.42: Percentage of occurrence in nine major sensory defects for brine-salted (n = 8) and retentate-salted (n = 8) Camembert cheese at the age of four weeks. The samples were stored at 4 ± 1 °C post-packaging. .............................................................. 82

Figure 4.43: Percentage of occurrence in nine major sensory defects for Camembert cheese acidified to pH 5.2 (n = 8) and pH 4.9 (n = 8) at the age of four weeks. The samples were stored at 4 ± 1 °C post-packaging. .............................................................. 83

Figure 4.44: Percentage of occurrence in nine major sensory defects for Camembert cheese made using tube moulds (n = 8) and small moulds (n = 8) at the age of four weeks. The samples were stored at 4 ± 1 °C post-packaging. .............................................................. 83

Figure 4.45: Consumer overall acceptance of high-fat (n = 225) and low-fat (n = 620) Camembert cheese at the age of four weeks. The cheese samples were stored at 4 ± 1 °C post-packaging. ⊕ represents the mean; horizontal lines represent upper quartile, median, and lower quartile respectively from top to bottom; * represents outliers. .... 86

Figure 4.46: Consumer overall acceptance of brine-salted (n = 420) and retentate-salted (n = 425) Camembert cheese at the age of four weeks. The cheese samples were stored at 4 ± 1 °C post-packaging. ⊕ represents the mean; horizontal lines represent upper quartile, median, and lower quartile respectively from top to bottom; * represents outliers. .............................................................. 86

Figure 4.47: Consumer overall acceptance of Camembert cheese acidified to pH 5.2 (n = 413) and pH 4.9 (n = 432) at the age of four weeks. The cheese samples were stored at 4 ± 1 °C post-packaging. ⊕ represents the mean; horizontal lines represent upper quartile, median, and lower quartile respectively from top to bottom; * represents outliers. .............................................................. 87

Figure 4.48: Consumer overall acceptance of Camembert cheese made using small mould (n = 414) and tube mould (n = 431) at the age of four weeks. The cheese samples were stored at 4 ± 1 °C post-packaging. ⊕ represents the mean; horizontal lines represent upper quartile, median, and lower quartile respectively from top to bottom; * represents outliers. .............................................................. 87

Figure 4.49: Consumer overall acceptance of sixteen treatments of Camembert cheese at the age of four weeks. The cheese samples were stored at 4 ± 1 °C post-packaging. The sample size of consumer panellists varied between 21 and 43 panellists per treatment. ⊕ represents the mean; horizontal lines represent upper quartile, median, and lower quartile respectively from top to bottom; * represents outliers. .............................................................. 88
Figure 5.1: The rind discolouration defect, shown by browning of the mould, with some discolouration on the edges. .................................................................101

Figure 5.2: The rind deformation defect, shown by unevenness and concaving of the rind. ..............................................................................................................102

Figure 5.3: The thick rind defect, shown in the UF Camembert cheese (left) comparing to the Camembert made conventionally (right). .........................................102

Figure 5.4: The core unevenness defect, shown by the overripened soft and flowing texture in the outer portion and firm (still chalky) texture in the inner portion of the cheese paste. .................................................................103

Figure 5.5: Results of softening at a mild degree (left), and over softening (right) with the development of a flowing texture of the cheese paste. .................................104
# LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HB4.9S</td>
<td>High-fat, brine-salted, pH 4.9, small mould treatment</td>
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