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2021**

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VOC profile of high moisture mozzarella as affected by the processing temperature

Dott. Natrella Giuseppe

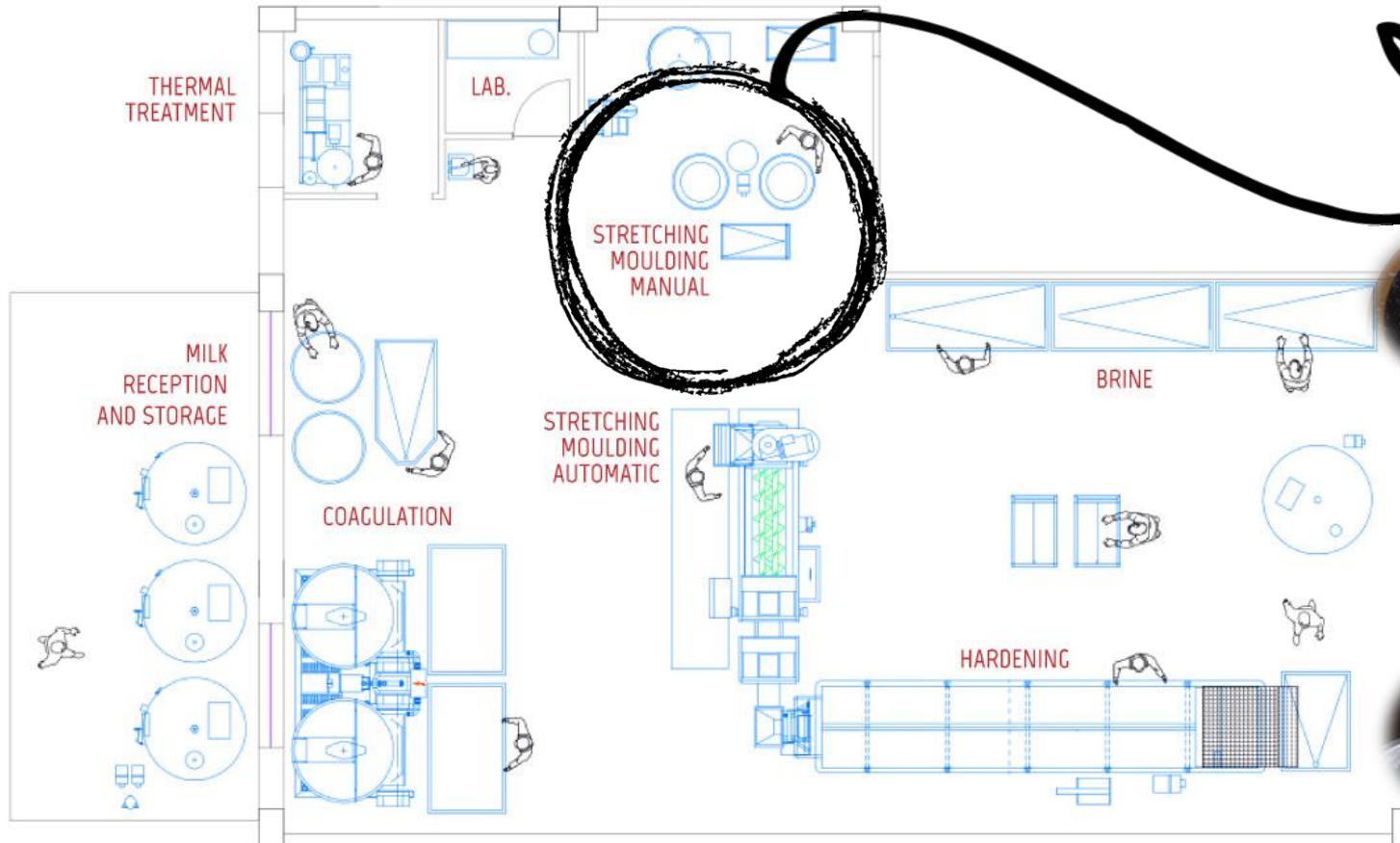
The Department of Soil, Plant and Food Sciences -University of Bari

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PASTA FILATA CHEESE

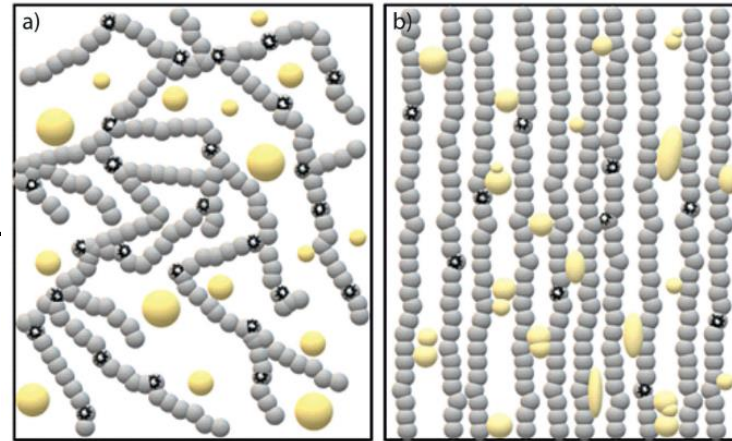


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PASTA FILATA CHEESE: The stretching phase



✦ Insoluble calcium Protein matrix Fat



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PASTA FILATA CHEESE: Literature

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ORIGINAL ARTICLE

Journal of
Food Processing and Preservation

WILEY

Effect of the stretching temperature on the texture and thermophysical properties of Mozzarella cheese

Mônica Correia Gonçalves¹ | Haíssa Roberta Cardarelli²

J. Dairy Sci. 90:2103–2112
doi:10.3168/jds.2006-795
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Proteolysis in Mozzarella Cheeses Manufactured by Different Industrial Processes

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Research Note

Time and Temperature of Stretching as Critical Control Points for *Listeria monocytogenes* during Production of Mozzarella Cheese†

JUNGHEE KIM, KAREN A. SCHMIDT,* RANDALL K. PHEBUS, AND IKE J. JEON

Department of Animal Sciences and Industry, Kansas State University, Manhattan, Kansas 66506-1600, USA

J. Dairy Sci. 86:449–456
© American Dairy Science Association, 2003.

The Effect of Compression, Stretching, and Cooking Temperature on Free Oil Formation in Mozzarella Curd

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*Institute of Land and Food Resources,
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Melbourne, Australia
†University of Waikato,
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‡New Zealand Dairy Research
Institute, Palmerston North,
New Zealand

Influence of Screw Speeds of the Mixer at Low Temperature on Characteristics of Mozzarella Cheese¹

Letters in Applied Microbiology 2003, 36, 73–76

Fate of *Escherichia coli* O157:H7 during the manufacture of Mozzarella cheese

G. Spano¹, E. Goffredo², L. Beneduce¹, D. Tarantino¹, A. Dupuy³ and S. Massa¹

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2002/230: received 16 July 2002, revised 23 October 2002 and accepted 31 October 2002

DAIRY FOODS

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DAIRY FOODS

Fate of *Listeria monocytogenes* During the Manufacture and Ripening of Parmesan Cheese

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LWT - Food Science and Technology 104 (2019) 16–23

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Changes in water mobility and protein stabilization of Mozzarella cheese made under different stretching temperatures



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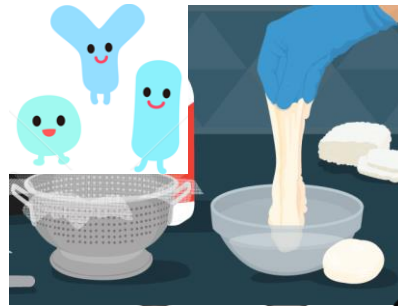
AIMS

1



Does the stretching phase cause the formation of new VOC?

2



What happens to the VOC profile during stretching phase in presence of microorganism?

3



Does the different stretching water temperature affect the odor intensity of mozzarella?

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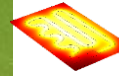
LEGEND:



Raw milk



Calf rennet 0.2 ml/L



Heater



Curd



Sodium azide



Citric acid solution 10%



Stretching water

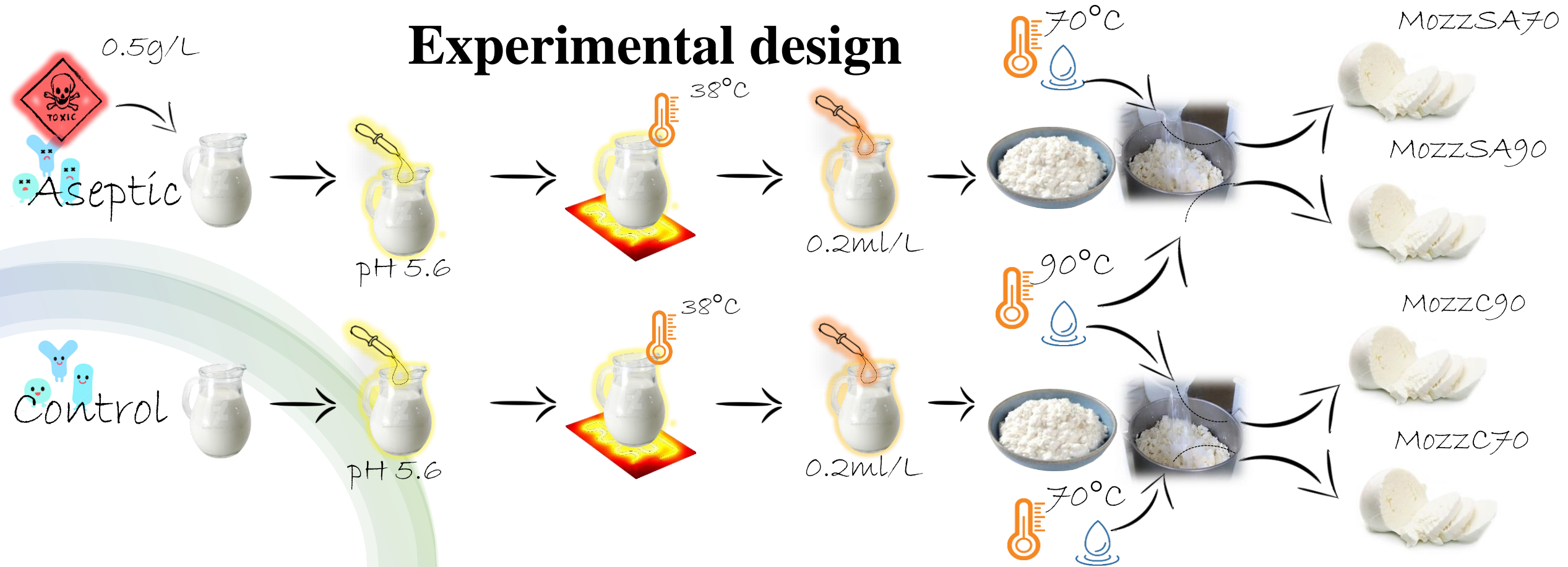


Temperature



Mozzarella

Experimental design

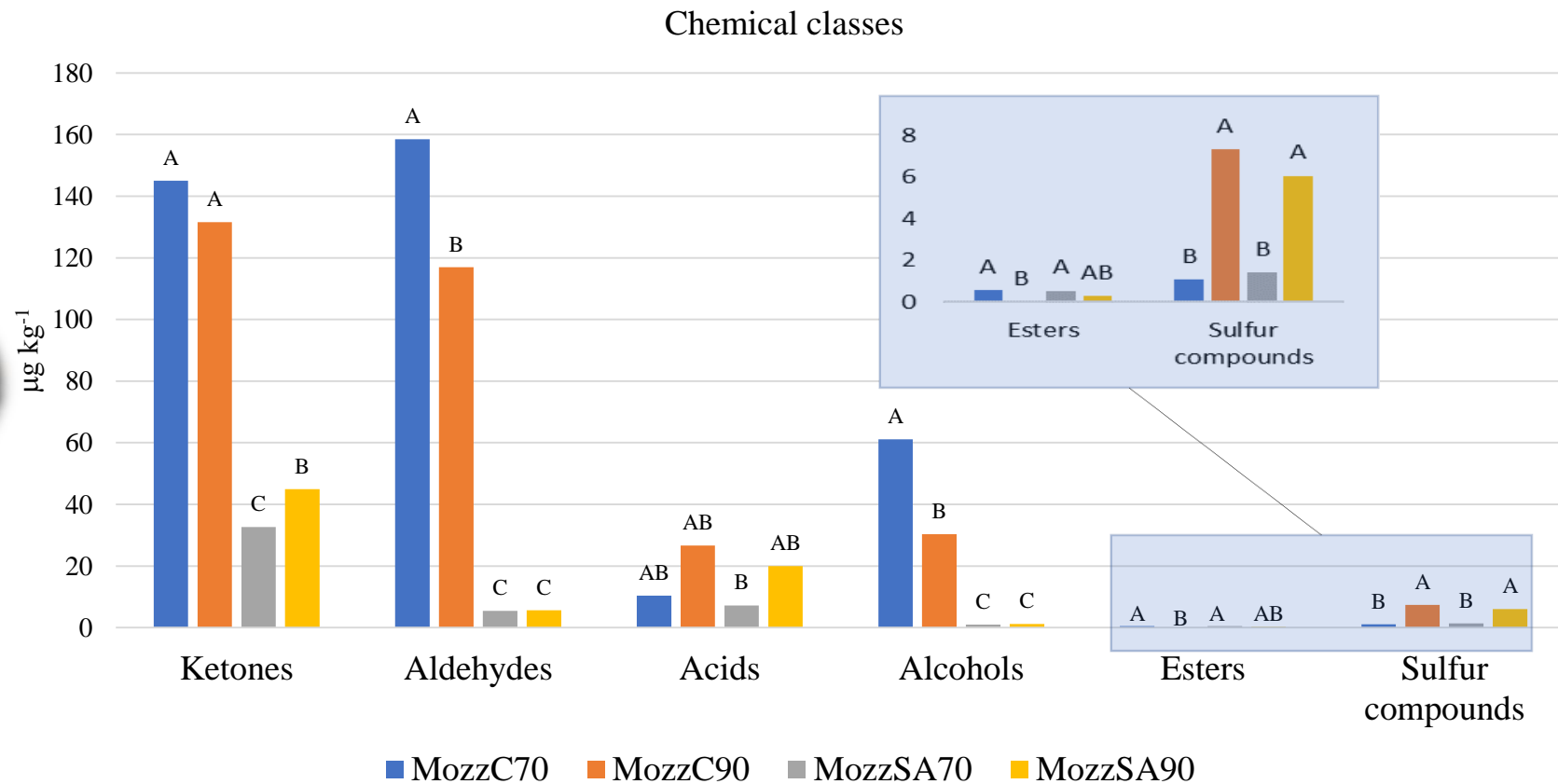


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Total VOC amount

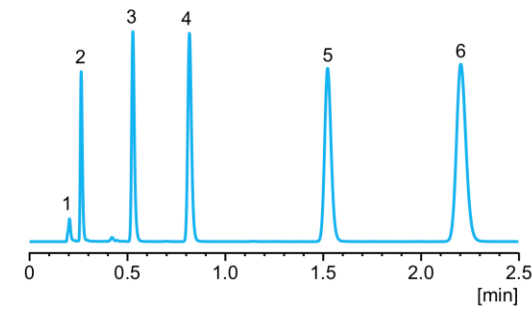


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**MOST
IMPORTANT VOC
FOUND**



Compound	Curd C	Mozz C70	Mozz C90	Curd SA	Mozz SA70	Mozz SA90
Acetic acid	10.43 ^a	7.14 ^a	14.52 ^a	3.56 ^b	1.29 ^b	3.63 ^b
Butanoic acid	7.68 ^a	1.02 ^c	3.97 ^b	6.28 ^a	2.01 ^{bc}	6.58 ^a
3-Methyl-Butanoic acid	0.00 ^b	0.96 ^a	1.54 ^a	0.00 ^b	0.00 ^b	0.00 ^b
Hexanoic acid	9.02 ^a	1.23 ^c	4.97 ^{ab}	8.47 ^a	2.34 ^b	7.24 ^a
Octanoic acid	3.47 ^a	0.00 ^c	1.66 ^b	3.29 ^a	1.59 ^b	2.50 ^a
2-Methyl-Butanal	3.77 ^a	2.18 ^a	2.25 ^a	0.00 ^b	0.00 ^b	0.00 ^b
3-Methyl-Butanal	32.48 ^c	152.17 ^a	109.07 ^b	0.00 ^d	0.00 ^d	0.00 ^d
Hexanal	7.20 ^a	0.50 ^d	1.40 ^{cd}	4.63 ^b	1.02 ^{cd}	2.61 ^c
Heptanal	2.68 ^a	0.30 ^c	0.00 ^d	1.88 ^{ab}	1.37 ^b	0.00 ^d

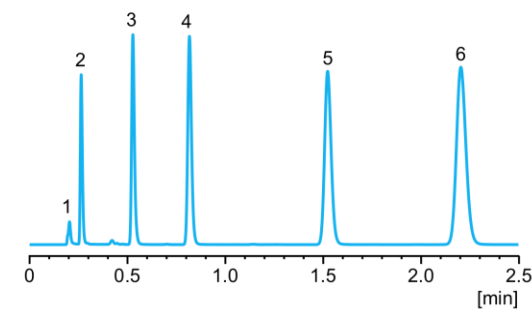


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**MOST
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FOUND**



Single VOC	Curd C	Mozz C70	Mozz C90	Curd SA	Mozz SA70	Mozz SA90
Ethanol	0.08 ^c	9.58 ^a	1.98 ^b	0.00 ^d	0.00 ^d	0.00 ^d
3-Methyl-1-Butanol	3.1 ^c	50.48 ^a	27.17 ^b	0.00 ^d	0.00 ^d	0.00 ^d
Acetone	39.46 ^a	32.21 ^{ab}	27.05 ^b	42.58 ^a	15.02 ^d	21.70 ^{cd}
2-Butanone	35.73 ^a	19.23 ^c	23.48 ^{bc}	33.80 ^{ab}	16.17 ^c	21.99 ^{bc}
6-Methyl-5-hepten-2-one	0.62 ^a	0.47 ^b	0.28 ^c	0.53 ^{ab}	0.19 ^c	0.18 ^c
Acetoin	11.13 ^b	92.51 ^a	80.06 ^a	1.46 ^b	0.77 ^b	0.61 ^b
2-Nonanone	0.00 ^b	0.14 ^a	0.14 ^a	0.00 ^b	0.00 ^b	0.00 ^b
Ethyl acetate	0.00 ^b	0.55 ^a	0.00 ^b	0.00 ^b	0.54 ^a	0.30 ^a

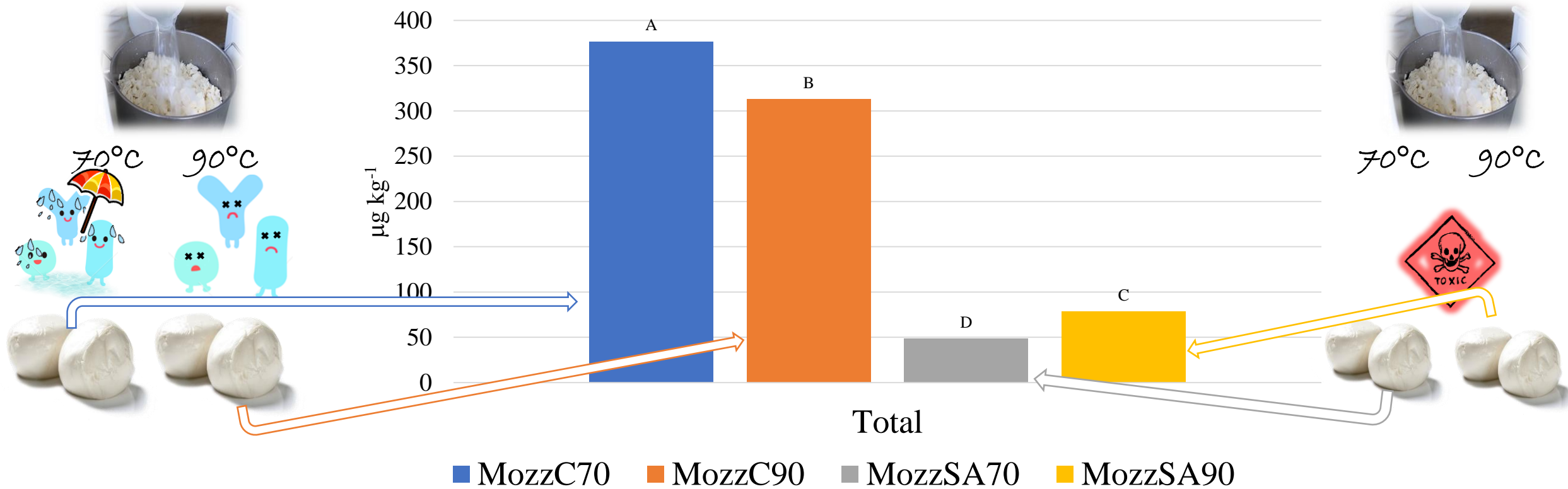


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The heating
intensity



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Sensory point of
view: Ranking

Odor intensity



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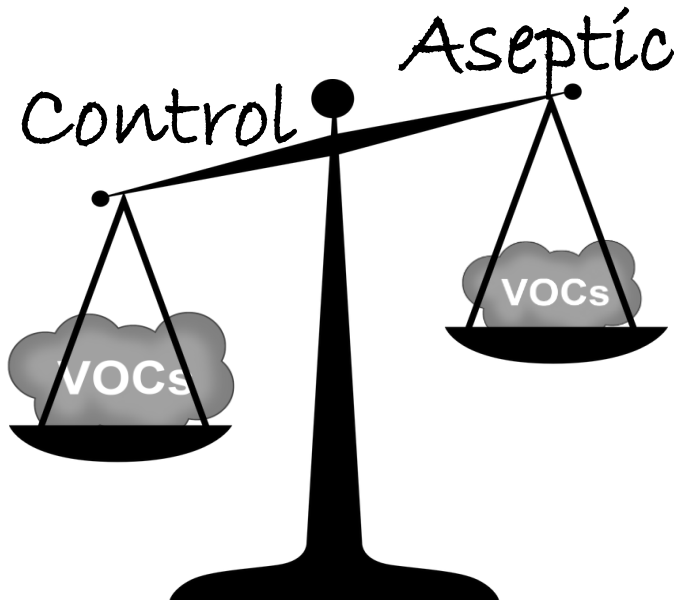
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Sensory point of
view: Ranking

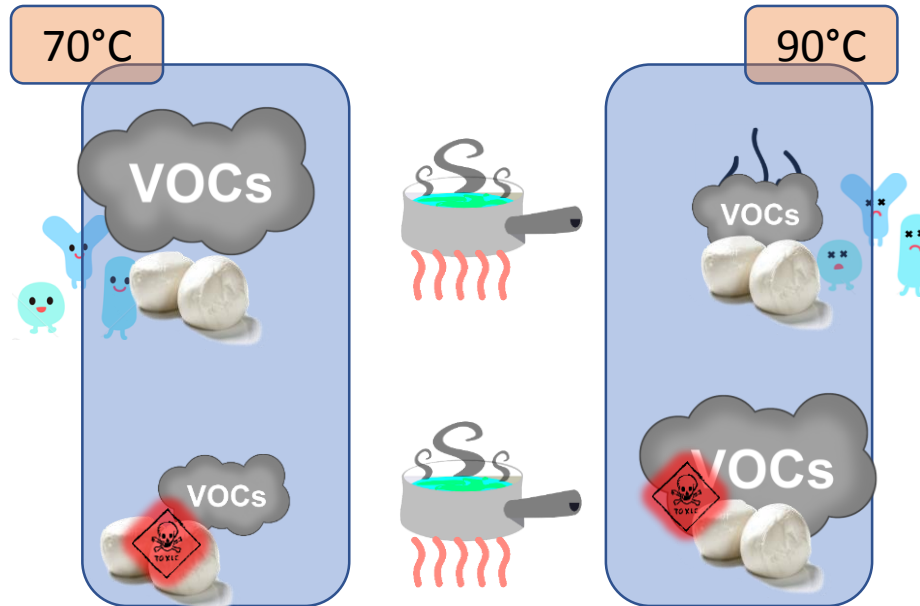
More pleasant odor



CONCLUSION



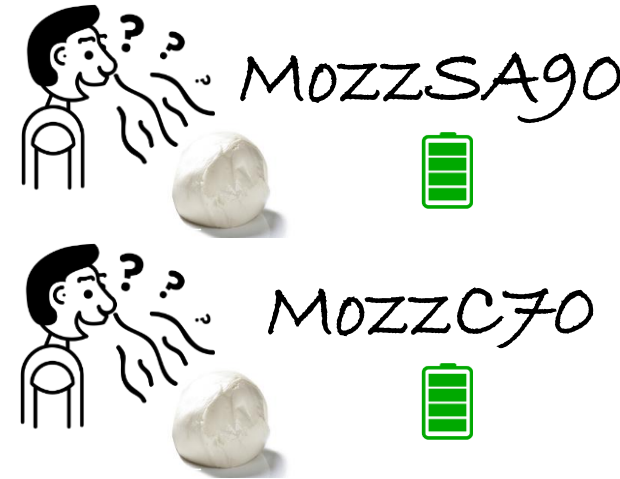
Single and total VOC content of control mozzarella result higher than aseptic mozzarella



Lower stretching temperature preserve the aroma of control mozzarella, preserving the microbial activities

Higher stretching temperature led to a more intense volatilization of VOC in mozzarella control

Higher stretching temperature led to a higher VOC content when bacteria are absent



The odor intensity result higher in mozzarella stretched at lower temperature, due to a less intense volatilization