The impact of the skim milk powder manufacturing process on the flavor of model white chocolate

Article

Accepted Version

The Impact of the Skim Milk Powder Manufacturing Process on the Flavor of Model White Chocolate

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Table S1 Reference materials provided to help assessors to standardize attribute descriptors

Descriptor	Reference material
sour cream, lactic, cheesy (odor and flavor)	natural yogurt
cocoa butter (odor)	cocoa butter hand cream
caramel (odor)	caramel syrup
brown sugar (flavor)	muscovado sugar
caramel (flavor)	caramel syrup
fudge (flavor)	dairy fudge*
condensed milk (odor and flavor)	evaporated and sweetened condensed-milk
creamy (flavor)	cream
nutty (odor and flavor)	roasted hazelnuts

* Dairy fudge purchased from a UK supermarket was a typical example of a UK fudge, consisting of only sugar, butter and condensed skim milk

Table S2 Mean panel scores (n = 9) for sensory attributes of two types of white chocolate produced using skim milk powders of different heat treatments – high heat (HHCHOC), low heat (LHCHOC)

attribute		score [a]		LSD [b]	P [c]		
		HH CHOC	LH CHOC		S	A	I
appearance							
	shininess	17	18	9.0	ns	*	ns
	yellow	54	34	3.5	***	***	ns
odor							
	sweet	37	38	7.0	ns	**	ns
	vanilla	16	16	6.9	ns	*	ns
	caramel	22	13	12	ns	ns	***
	evaporated milk	32	24	12	ns	ns	ns
	cheesy	6.4	4.5	6.5	ns	ns	*
	cocoa butter	16	12	7.5	ns	*	*
	cardboard	8.9	7.6	7.0	ns	**	**
taste							
	sweet	48	47	7.2	ns	**	ns
	acidic	7.8	6.9	3.4	ns	**	ns
	salty	7.0	7.3	1.3	ns	***	ns
flavor							
	overall flavor intensity	53	43	5.5	**	*	ns
	vanilla	18	18	3.1	ns	***	ns
	fudge	28	16	11.9	*	ns	***
	condensed-milk	31	23	6.3	*	ns	ns
	cheesy	4.1	2.2	5.3	ns	ns	**
	cocoa butter	15	12	6.5	ns	*	ns
mouthfeel							
	hardness of bite	29	42	11	*	ns	*
	speed of melting	38	33	11	ns	*	***
	mouth coating	31	33	8.2	ns	**	ns
	smoothness	57	59	6.8	ns	***	ns
	grains	6.3	5.2	4.7	ns	*	*
	mouth-watering	22	21	4.0	ns	***	ns
	fatty	28	32	10	ns	*	ns
	adhesive	27	26	10	ns	*	ns
	mouth drying	13	13	5.4	ns	**	*
	tongue tingling	1.3	1.4	3.6	ns	ns	**
	throat catching	7.0	11	8.5	ns	ns	*
after-effects							
	sweet	41	40	6.2	ns	**	ns
	salt	5.3	5.3	2.0	ns	***	ns
	acidic	6.7	5.7	3.2	ns	**	ns
	mouth drying	14	12	3.0	ns	***	ns
	mouth coating after swallow	19	16	7.0	ns	*	*

[a] Means not labelled with the same letters are significantly different ($p<0.05$); means of two replicate assessment for each assessor (18 replicates in total).

[b] Least significance difference at $p = 0.05$.

[c] Probability, obtained from ANOVA, that there is a difference between means; ns, no significant difference between means ($p>0.05$); * significant at the 5% level; ** significant at the 1% level; *** significant at the 0.1% level; F-ratios for sample and assessor were calculated by comparing the mean square of the effect with the mean square of the sample × assessor interaction; S: significance of samples, A: significance of assessors, I: significance of the interaction (S ×A).