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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).