



Validation of the human nose based method “hot water” for boar taint detection

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Introduction

By 2018, a total stop of castration in the EU could be a fact in consequence of a Brussels declaration that was signed very recently. This has resulted in work all over the EU with methods that can be used in the slaughterhouses to screen and detect the tainted male pigs with the purpose of sorting out the meat from these pigs, as many consumers do not like tainted meat. In Denmark, we have among other methods, chosen to work with the so-called “hot water method” based on detection using the human nose.

The aim of the present study was to validate some of the practical issues regarding the “hot water method”.



Conclusion

The “hot water method” has been validated regarding the amount of lard and temperature at assessment. It was concluded that 5 g of lard and a temperature of approx. 80°C are optimal for a valid assessment when detecting the presence of boar taint. It can further be concluded that there is no apparent decrease in sensitivity during the assessment of 200 samples.

Materials and methods

The method set-up is simple: lard cut into smaller pieces is put into a 100 mL conical flask and 75 mL of boiling hot water are poured over the lard. The flask is “closed” with tinfoil and left standing for 2 min before assessment.

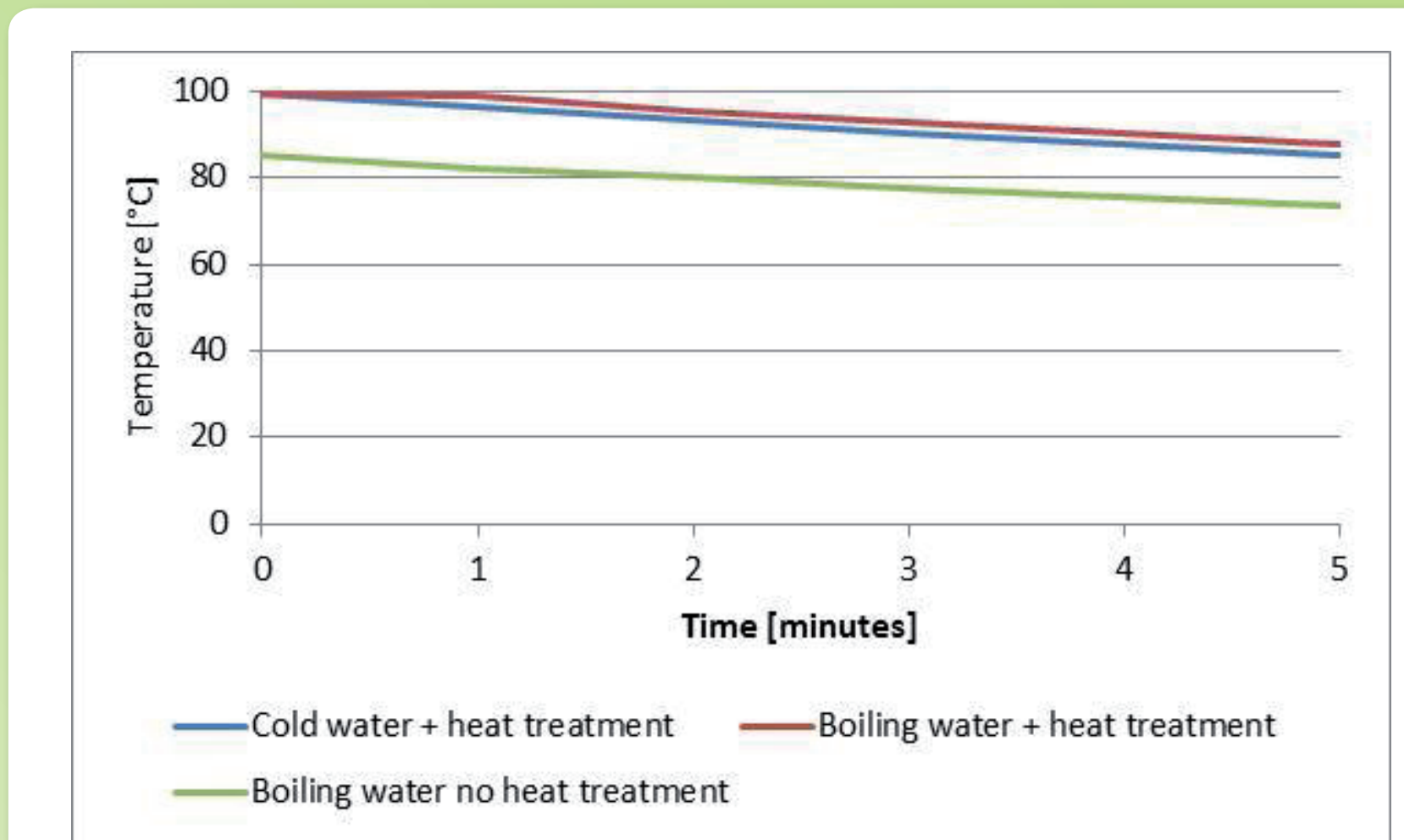
Method validation was performed as a series of individual studies: 1) Optimal amount of lard, 2) optimal temperature at assessment and 3) manageable number of samples per day. All validation experiments were performed using lard in which the content of androstenone, skatole and indole (ASI) was known.

Optimal amount of lard: 1 g, 5 g and 10 g. Three trained assessors performed the boar taint detection.

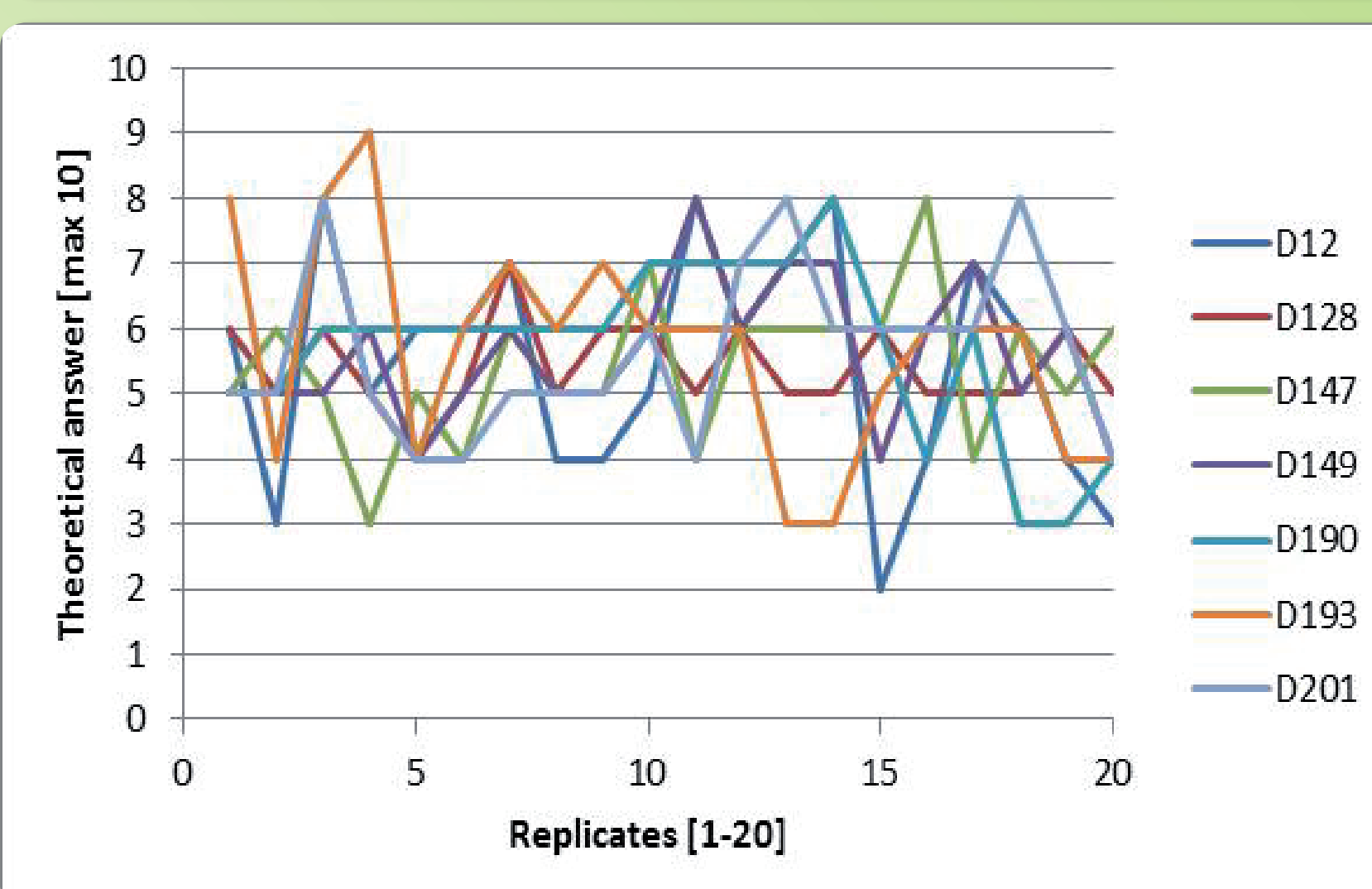
Optimal temperature: 1) cold water poured over the lard and heated until boiling, 2) boiling water from electric kettle poured over the lard and 3) boiling water from an electric kettle poured over the lard and heated until re-boiling. Three trained assessors assessed the samples.

Manageable number of samples per day: seven trained assessors assessed 200 samples each. The lard used was from ten pigs with a large variation in ASI-concentrations and the assessors evaluated each of the ten pigs 20 times with all ten pigs present in each round of replicates. All 200 samples had individual 3-digit codes.

Results



The preferred temperature at assessment was approx. 80°C. The proper amount of lard was 5 g. One gram was not enough to create odour intensity for valid detection, and 10 g of lard did not increase odour intensity noticeably compared with 5 g lard.



Sensitivity was not clearly changed during the evaluation of 200 samples. All assessors showed fluctuations between the correct numbers of answers (based on skatole limit of 0.25 ppm) in each of the 20 rounds of replicates.

The scale used was: 0 = no boar taint; 1 = weak boar taint; 2 = strong boar taint and 3 = doubt. The overall character (all assessors, all 20 replicates) given each pig assessed by the seven trained panelists. The theoretical correct answer is based on skatole limit of 0.25 ppm. nd = not detected.

Gender and no.	Skatole	Andro.	Indole	DMRI panel overall	Theoretical answer
Female 1	0.017	nd	nd	0	0
Female 2	0.030	0.000	0.030	0	0
Male 3	0.032	0.758	nd	0/1	0
Female 4	0.060	0.017	0.036	0	0
Male 5	0.105	0.829	0.061	0/1	0
Male 6	0.161	1.963	0.068	2	0
Male 7	0.208	2.262	0.649	1/2	0
Male 8	0.307	1.218	0.104	2	1-2
Male 9	0.579	3.490	0.432	2	1-2
Male 10	0.669	0.995	0.098	2	1-2

Half of the panelists detected boar taint in pig no. 3 and no. 5 and the other half did not. This can be explained by differences in sensitivity towards androstenone.



Discussion

This validation work is on-going. When selecting and training future assessors it is important to address androstenone sensitivity, as this seems to be the major reason for variation in the human nose based assessments leading to either “pig approved” or “pig rejected”. Among other issues to be addressed is the scaling. Which scale to use in the daily assessments in the slaughterhouses must be well-defined and should reflect the individual slaughterhouse capacity for sorting.

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