

Reducing cooking time of sous vide cooked pulled pork using proteolytic enzymes

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INTRODUCTION

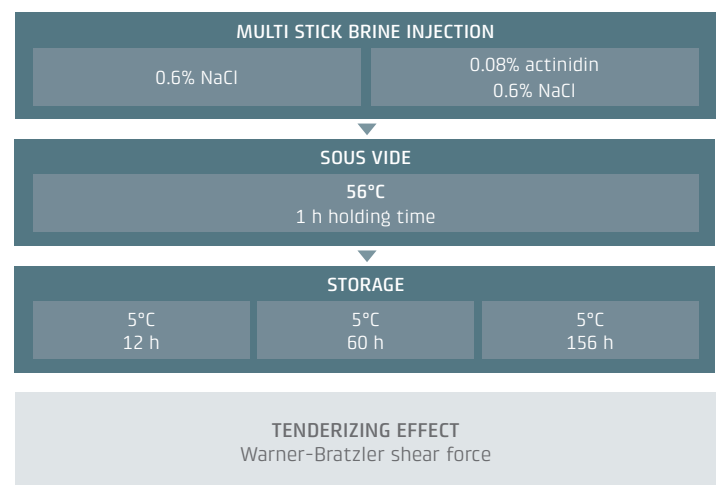
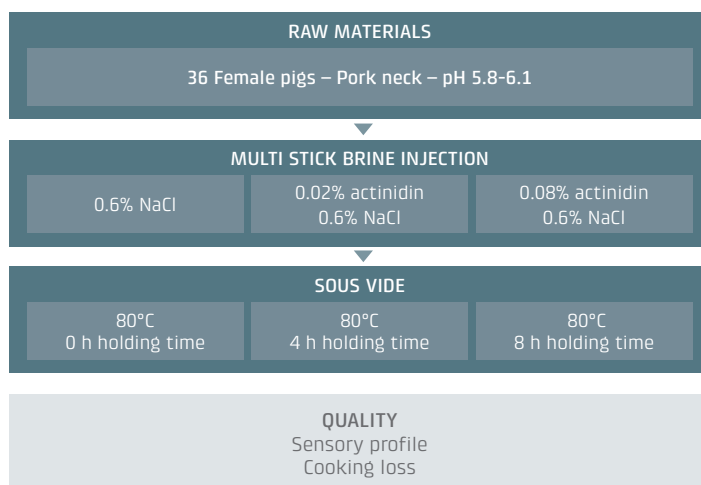
Sous vide cooking has become more common in private households and foodservice as well as on an industrial scale. Low cooking loss and quality improvements are some of the benefits of using sous vide because the process can be performed at 55-65°C for a prolonged time. Long cooking times are mainly for cuts that need tenderization. When sous vide cooking is optimized for large-scale production, it is important to minimize the cooking time to increase productivity.

AIM

Investigate cooking time reduction by actinidin (Ingredient Resources, Warriewood, Australia) injection and determine the tenderizing effect of actinidin for process and quality control.

CONCLUSION

Injection of a brine containing actinidin did not affect flavour, colour, juiciness or cooking loss. For pulled pork, it was possible to obtain comparable tenderness at a reduced cooking time of 4 h instead of 8 h, when actinidin was added as a tenderizer. Actinidin did not have any tenderizing effect after heat treatment to a core temperature of 56°C.



RESULTS

Table 1: Sensory attributes of pulled pork with different actinidin concentrations and holding times at 80°C. Different letters within a row indicate significant differences between treatments at 5% level.

	Actinidin						Reference
Concentration	0.02%	0.08%	0.02%	0.08%	0.02%	0.08%	0.00%
Holding time	0 h	0 h	4 h	4 h	8 h	8 h	8 h
Cooking loss	33.6 ^a	36.0 ^b	40.4 ^d	39.4 ^{cd}	38.8 ^c	38.8 ^c	38.7 ^c
Tenderness	7.6 ^a	7.7 ^a	9.9 ^b	10.4 ^{bc}	12.4 ^c	12.5 ^c	11.6 ^{bc}
Pulliness	3.0 ^a	4.3 ^b	9.0 ^c	9.4 ^c	13.2 ^e	13.2 ^e	12.2 ^d
Juiciness	7.2 ^a	7.0 ^a	7.3 ^a	7.2 ^a	7.6 ^a	8.8 ^a	8.0 ^a
Flavour	1.6 ^b	2.0 ^b	2.1 ^b	1.5 ^{ab}	1.3 ^{ab}	1.6 ^{ab}	0.5 ^a
Colour	10.2 ^a	10.3 ^a	10.5 ^{ab}	11.2 ^{ab}	11.4 ^b	11.0 ^{ab}	10.6 ^{ab}

Injection of actinidin had a positive effect on the tenderness and pulliness of pulled pork. Tenderness was maintained at a 4 h reduced holding time by using actinidin. The addition of actinidin did not affect colour or juiciness. Flavour was for some treatments significantly higher than the reference although no systematic effect was observed.

The concentration (0.02 vs. 0.08%) of actinidin did not affect the sensory attributes of the pulled pork, thus, to optimize the technology, it should be considered to keep the enzymes active for a longer time, Table 1.

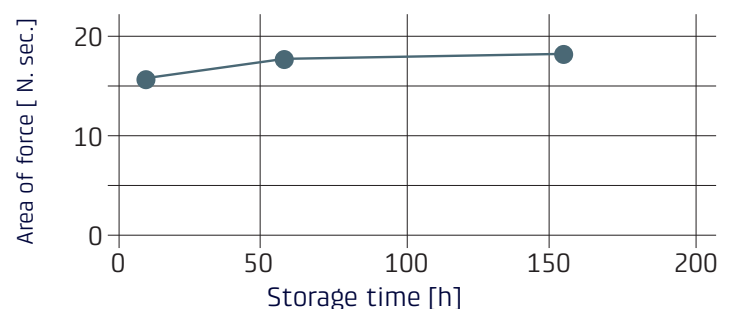


Figure 1: Total force needed to cut through the muscle Serratus ventralis cervicis, injected with 0.08% actinidin brine.

The total force needed to cut through the samples did not change during storage at 5°C (Figure 1) indicating that the tenderizing effect of actinidin had been stopped.



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