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How to reduce cooking time of sous vide cooked pulled pork with proteolytic enzymes

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Abstract: (Your abstract must use **Normal style** and must fit in this box. Your abstract should be no longer than 300 words. The box will 'expand' over 2 pages as you add text/diagrams into it.)

Sous vide has been known since the 1970s and is mainly used by gourmet chefs. During the last decade, sous vide cooking has become more commonly used both in private households, foodservice and in industrial scale. The reason for this success might be the benefits such as low cooking loss, quality improvement and long shelf life of the cooked meat. The benefits are caused by a time and temperature controlled process, often performed at 55-65°C/131-149°F for a prolonged time. If sous vide cooking is to be optimized for large-scale production, the cooking time must be reduced and productivity increased.

After initial heating, where the core temperature of the products reaches the set temperature, products are kept at the specific cooking temperature until the necessary bacterial kill is obtained. Tender cuts can be cooled or served soon after, while tough cuts must be tenderized for up to 70 hours. In these experiments, proteolytic enzymes (% of raw muscle weight) originating from fruits and microbes were injected into pork neck fillet (10% weight gain) to examine if tenderization was sufficiently accelerated to reduce the cooking time, without compromising eating quality and appearance of the pulled pork.

Among the five screened proteolytic enzymes, actinidin (0.02% and 0.05%) from kiwifruit and the protease NS (0.03%) were the most promising for meat tenderization, as the enzymes bromelain (0.01%) from pineapple, protease from *Aspergillus oryzae* (0.02% and 0.04%) and *Bacillus subtilis* (0.02%) resulted in over-tenderization, squashy appearance and off-flavour development.

Injection of actinidin (0.02% and 0.05%) before cooking at 80°C/176°F showed significant improvement in pulliness, juiciness and cooking yields. Further trials investigating inactivation of actinidin for process and quality control, and trials for estimating cooking time reduction have been carried out. New results will be available at the congress.