PE4.35 Processed pork of two RN-genotypes - effect of polyphosphate and salt on yield and instrumental texture in a model system 128.00

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***Abstract*—The combined effect of sodium tripolyphosphate (STPP) and salt (NaCl) on processing yield and instrumental texture was studied in a model system of cooked cured pork loin of the two RN-genotypes RN^- and rn^+. The aim was to evaluate if it is possible to increase the generally lower processing yield with pork of the RN^- genotype to the same level as with pork of the rn^+ genotype by using STPP. A central composite experimental design with three levels of STPP (0, 0.25 and 0.50%) and salt (1.4, 1.9 and 2.4%) was used. The samples were prepared by mixing minced pork loin with brine, stuffing into plastic tubes and cooking to 75ºC internal temperature in a water bath. Processing yield was calculated. Compression was measured on the cylindrical samples and maximal load was used as hardness parameter. Response surface analysis showed that a model including interaction between STPP and salt and quadratic terms of STPP and salt was significant (P=0.001) for both processing yield and maximum load in samples of both genotypes. The processing yield could be increased to the same level in both genotypes using 0.30% to 0.35% STPP at salt levels of 2.4% and 1.9%, but the same was not fully obtained at the lowest salt level 1.4%. Maximal load reached the same level for both genotypes already at 0.20% to 0.25% STPP at salt levels of 2.4% and 1.9%, but the same was not fully obtained at the lowest salt level 1.4%. Further studies are needed to evaluate how these STPP and salt levels influence the sensory profile within taste, flavour and texture.**

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***Index Terms* — Compression, NaCl, polyphosphate, processing yield, RN-genotype**

I. INTRODUCTION

Meat from purebred Hampshire pigs or Hampshire crosses carrying the RN^- allele (Rendement Napole) has high eating quality in both fresh meat and processed products such as cured-smoked pork loins and cooked ham. However, meat from carriers of the RN^- allele has lower water-holding capacity (WHC) compared to non-carriers (rn^+), which leads to lower processing yield [1, 2]. Both salt (NaCl) and phosphate improve the WHC of meat and they have a strong synergistic effect [3]. Salt induces swelling of the myofibrillar structure and phosphate has the ability to break actomyosin bonds, leading additional myofibrillar swelling [3, 4]. This results in an alteration of the texture of the finished meat product. Furthermore, adding excessive amounts of phosphate can lead to a rubbery consistency and loss of fibrous structure, both of which may be perceived negatively by consumers [3].

The combined effect of sodium tripolyphosphate (STPP) and salt (NaCl with 0.6% $NaNO_2$) on processing yield and instrumental hardness measured by compression was studied in a model system of cooked cured pork loin of the two RN-genotypes RN^- and rn^+. The aim was to evaluate if it is possible to increase the generally lower processing yield with pork of the RN^- genotype to the same level as with pork of the rn^+ genotype by using STPP in addition to salt and how that affects instrumental hardness.

II. MATERIALS AND METHODS

A. Meat

Pork loins (*M. longissimus dorsi*, LD) from the crossbreed [Hampshire x (Swedish Yorkshire x Swedish Landrace)] were used. The pigs were slaughtered at a commercial slaughterhouse in Sweden, cut three days post mortem and transported chilled to the Faculty of Life Sciences at University of Copenhagen. For preliminary identification of the genotypes RN^- or rn^+ the glucose content was measured in the meat juice [6] and pH was measured in the meat using a Knick Portamess 751 Calimatic pH-meter (Knick Elektronische Mess Geräte GmbH & Co., Berlin, Germany) equipped with a Hamilton double pore electrode (Hamilton Bonaduz AG, Switzerland). Five LD muscles were considered to be RN^- genotype and three LD muscles were considered rn^+ genotype.