ELECTRIC CONDUCTIVITY AS AN INDEX TO EVALUATE EMULSION CAPACITY OF PORK HAM WITH DIFFERENT FAT LEVELS IN TWO SALT SYSTEMS

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Introduction

Emulsion meat products are always popular and also represent a large percentage of the processed meat market (Barbut, 1995). Emulsion capacity can be used to evaluate the functional qualities in a raw meat system. Generally, a high emulsion capacity is required by the processors in meat industry. Many factors such as pH value, temperature, ionic strength, fat or water addition can affect the emulsion capacity of meat and unfortunately, there are no visible signs in the meat emulsion, prior to cooking, to indicate to the processor that the problem will occur. Electric conductivity of the emulsion will be incorporated to check a continuous aqueous phase of the batters with two salt systems (2.5% salt and 2.5%salt +0.3% polyphosphate) in this research. At the same time, a emulsion staining also will be performed to analysis the distribution of fat particle in meat emulsion.

Materials and Methods

In the first experiment, ground pork ham was homogenized with different % (0, 5, 10, 15, 20, 25, 30, 35 and 40%) of exogenous pork backfat, individually. In another experiment, ground pork ham was emulsified with different percentages (0, 5, 10, 15, 20, 25, 30, 35 and 40%) of pork backfat and two salt groups: 2.5% salt or 2.5% salt + 0.3% polyphosphate. Electrical conductivity (EC) value was determined with an electrical conductivity meter. Microstructure of meat emulsion analysis was as described by Ockerman (1976). The slide was rinsed in 70% ethanol and stained with 0.5% Sudan IV and counterstained with 10% bromphenol blue. All data was collected to analysis variance and significance between treatments by SAS (2002).

Results and Discussion

The results showed that the EC of ground pork ham without exogenous fat was 3.57 ms/cm. For exogenous fat added, the EC of ground pork ham significantly decreased with % of exogenous fat increasing. Figure 1 showed that a high negative correction coefficient was –0.96 and regression formulation: Y=-0.0398 X+3.3117, Y= electrical conductivity and X=levels of backfat. In the experiment of meat emulsion, the EC of two salt groups decreased

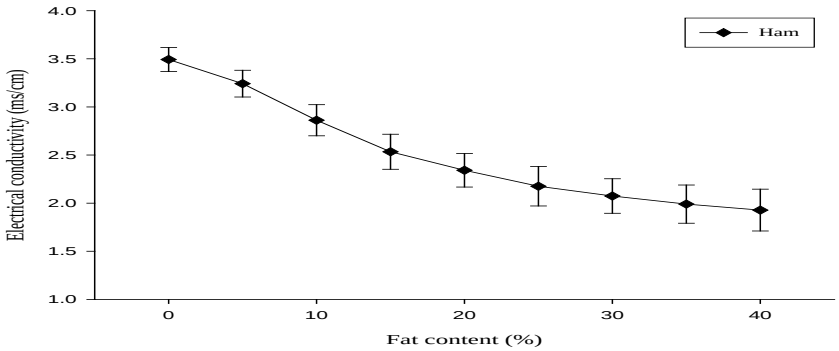


Figure 1 The relationship of exogenous fat levels and electrical conductivity.

with % of backfat increasing (Fig 2). The EC of 2.5% salt meat emulsion was from 14.84 ms/cm down to 10.82 ms/cm when backfat amount was increased from 0% to 40%(Fig2A). Similarly, the EC of 2.5% salt and 0.3 % polyphosphate meat emulsion was from 12.99 ms/cm down to 10.47 ms/cm (Fig 2B).

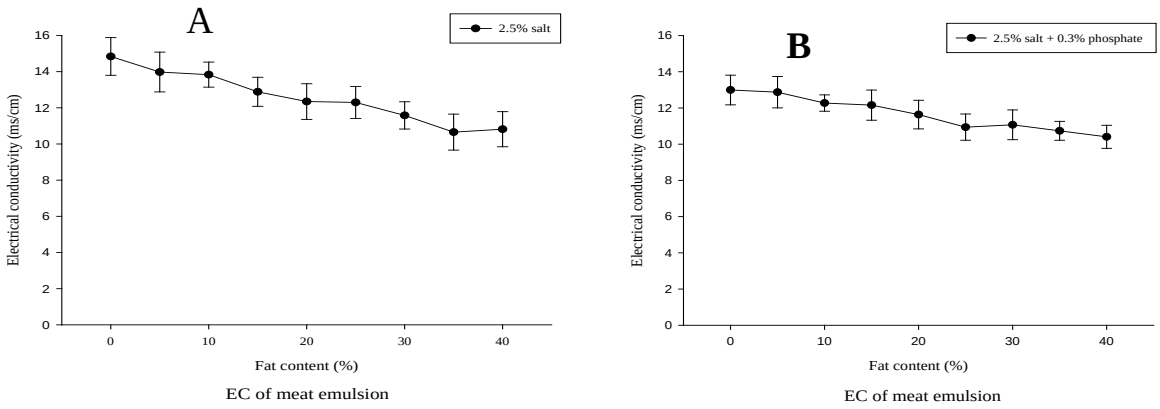
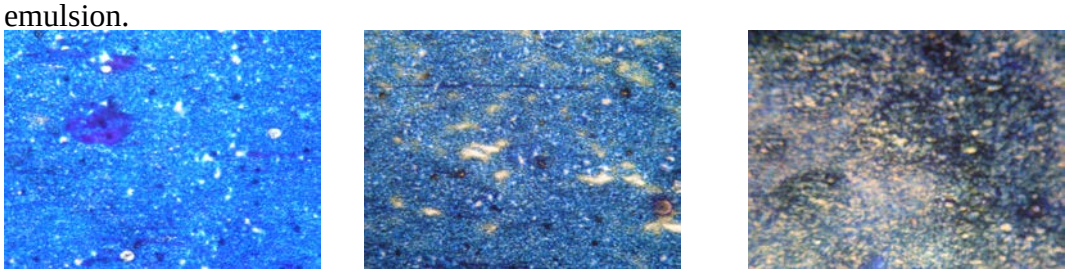


Figure 2. Changes of electrical conductivity of meat emulsion with different fat levels in two slat systems (A): 2.5% salt ; (B): 2.5% salt +0.3% polyphosphate.

The microstructure of meat emulsion with staining treatment will be observed in Figure 3 in this study. Significant visual variations were observed in meat emulsion with 2.5% salt and 0.3% polyphosphate and different fat levels. With higher levels of fat, the protein mass become thinner and fat particle smaller and gave a more uniform microstructure to the emulsion.



A (10% fat) **B (25% fat)** **C (40% fat)**

Figure 3 Microscopic appearance of meat emulsion with 2.5% salt +0.3 polyphosphate: (A) 10% backfat (B) 25% backfat (C) 40% backfat.

Conclusions

In conclusion, electrical conductivity can be used as an index for predicting ground pork with exogenous fat or emulsion in this research.

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