PLASMA PROTEIN
COMMINUTED COOKED MEAT PRODUCTS

PLASMA PROTEIN AS MULTIFUNCTIONAL INGREDIENT

Plasma protein has excellent functional properties with relation to the stabilization of the water/protein/fat matrix in a large variety of comminuted cooked meat products, such as luncheon meat, frankfurters, bologna and mortadella. By using this protein at the preparation of these meat products the risk is reduced that jelly and fat separation occurs during cooking. The application of recommended concentrations of plasma protein does not influence quality characteristics, such as consistency and sensoric parameters of cooked meat products.

Which plasma proteins
Sonac produces different plasma proteins from bovine and porcine origin. In particular, concentrated frozen plasma and plasma powder are very suitable at the preparation of comminuted cooked meat products. These protein ingredients reduce the jelly and fat separation of these meat products both with and without phosphate. Besides waterbinding, plasma proteins are also excellent fatbinders.

Plasma proteins can be applied in high concentrations without negative effects on the consistency of comminuted meat products. Sonac plasma proteins distinguish themselves by the relatively high admissible concentrations without sensoric deviations in the end products.

HOW TO USE PLASMA PROTEIN

At the preparation of comminuted cooked meat products plasma protein can be applied during the dough preparation. This can be done by adding (frozen) concentrated plasma or plasma powder directly to the dough in the cutter and mixing. Plasma protein (concentrated plasma or plasma powder) can also be used for the preparation of a protein/fat/water emulsion which is subsequently added to the dough and mixed.

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Gel PP 1:12 heated at 80 °C for one hour
Emulsion PP 1:1:10 heated at 80 °C for one hour

Natural Ingredients. Smart Solutions.
WHY DO PLASMA PROTEINS SCORE SO WELL

At the production of comminuted cooked meat products the application of plasma proteins offers the benefits of a multifunctional protein ingredient with excellent functional properties, like high solubility, and excellent gelling, strong water binding, and good emulsifying properties at heating due to its heat stability.

- High solubility
  - important prerequisite for other functional properties, and good distribution in the products
- Excellent gelling at heating - substantial contribution to the formation of the protein gel matrix and the consistency of the product
- Strong water binding at heating
  - essential for reducing the jelly separation
- Good emulsifying properties
  - important for reducing the fat separation and stabilization of the water/protein/fat matrix

RESEARCH FINDINGS

Figure 1: Influence of heating temperature on gel strength
Factor: temperature and gelling
- relatively strong gelling of plasma protein at lower temperatures
- plasma protein forms a stronger gel than other proteins

Source: International Food Marketing & Technology

Figure 2: Influence of pH on gel strength after heating
Factor: pH and gel strength
- different behavior of proteins
- stronger plasma protein gel at higher pH

Source: International Food Marketing & Technology
Figure 3:
**Effect of plasma protein on cooking loss of a Bologna type sausage at 100°C**
Factor: cooking loss
- effective reduction of jelly separation
- effective reduction of fat separation
- strong improvement of profit


Figure 4:
**Effect of plasma protein on total cooking loss of a Bologna type sausage at 80 and 120°C**
Factor: temperature
- effective in pasteurized products
- effective in sterilized products


Figure 5:
**Sensoric value of consistency, color and taste of a Bologna type sausage with plasma protein**
Factor: consistency, color and taste
- maintenance of good consistency at replacement of meat by plasma protein
- recommended concentrations don’t affect color and taste

**Which concentration delivers optimal result**
At the preparation of comminuted cooked meat products, optimal results of the application of plasma protein are dependent on both the product type and the production process. In general, the recommended maximal concentration in these meat products are as follows:

- concentrated frozen plasma maximal 7 % on product basis
- plasma powder maximal 2 % on product basis

**Legislation**
Plasma protein is an own protein to meat. On account of the excellent functional properties there is no need to treat plasma protein under special conditions or to modify the protein, so it can be applied in its natural, native form. At application, the status and labelling of plasma protein are provided by the national legislation of each country.

**PRODUCT INFORMATION ON PLASMA PROTEINS**

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<thead>
<tr>
<th></th>
<th>Concentrated frozen plasma</th>
<th>Plasma powder</th>
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<tbody>
<tr>
<td>Water (%)</td>
<td>77-80</td>
<td>5-8</td>
</tr>
<tr>
<td>Protein (%)</td>
<td>18-20</td>
<td>70-80</td>
</tr>
<tr>
<td>Salts (%)</td>
<td>1-2</td>
<td>± 18</td>
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<tr>
<td>pH (%)</td>
<td>± 10</td>
<td>7-8</td>
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**THE SUCCESS FACTORS OF PLASMA PROTEINS**

- Own protein to meat
- Excellent functional properties of natural protein
- Reduction of jelly separation of comminuted cooked meat products
- Reduction of fat separation of comminuted cooked meat products
- Effective concentrations without sensoric deviations
- Meat replacement

Sonac is a leading manufacturer of reliable ingredients of animal origin. With an active R&D program, reliable processes and sustainable end products Sonac continuously adjusts to market needs. A good geographical spread of locations and a broad portfolio of fats, proteins, minerals and specialties make Sonac a trusted partner for many international producers in food, pet food, feed and fertilizers, worldwide. Sonac is part of Darling Ingredients.

**For more information about this specialty product please contact us:**
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