

Method for the determination of added gelatin in ham and cream cheese



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Introduction

The globalisation of international commerce which also affects the food industry reliable and repeatable methods of chemical analysis have become essential for consumer protection. Ham and crème cheese products is still being pumped up secretly with water and gelatin to increase its size and weight. gelatin binds the water in the products. It is a fraud, that the proceeding industry make a profit of millions Euro with added water.

Sample Preparation and Analysis

For each of ham and cream cheese, three articles were purchased and analysed from standard supermarket suppliers.

5 g of the sample were weighed into a plastic cup and mixed with 30 mL ultrapure water and 5 mL internal standard (norleucine 10 $\mu\text{mol/mL}$). The sample was then homogenized with a commercial blender in intervals of 30 seconds. After addition of 10 mL sulfosalicylic acid (10 % w/w) the sample was incubated for 20 min at 4 °C and then filtered through a micro filter.

Acidic hydrolysis with microwave system:
0.5 mL of the filtrate was mixed with 7.5 mL of

hydrochloric acid (6 N) in a vessel body. the hydrolysis was performed at 150° for 15 minutes, cooled down to room temperature and the solution was evaporated on a hot block The residue was dissolved with 1 mL Sample Dilution Buffer.

The supernatant was filtered with a membraSpin (0.22 μm) by centrifugation at 14000 rpm for five minutes. The particle free solution was used for the injection.

The samples were analyzed by the Amino Acid Analyzer ARACUS, manufactured and distributed by membraPure GmbH worldwide. ARACUS is using the classic routine analysis of amino acids by post-column derivatization with ninhydrin and the detection at 440 nm and 570 nm.



Figure 1: Amino Acid Analyzer ARACUS

Results & Discussion

The Table 1 shows the results of the concentration of amino acids in three different samples of cream cheese and Table 2 of three different samples in ham.

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Table 1: Amino acid concentration of hydrolyzed NPN (non-protein-nitrogen) in sample **1**, **2** and **3** of cream cheese (mg/100 g).

Amino Acid	1	2	3
Asp	60.8	101.8	12.9
Thr	34.3	8.6	10.1
Ser	41.5	12.0	8.5
Glu	160.4	14.1	33.2
Gly	66.7	4.4	3.2
Ala	44.6	6.2	6.9
Val	35.3	5.9	6.8
Met	13.8	3.7	3.3
Ile	27.9	5.9	7.3
Leu	54.2	7.5	3.3
Tyr	14.8	4.3	3.5
Phe	19.8	3.5	2.6
His	18.6	3.9	3.3
Lys	51.9	9.5	8.8
Arg	35.2	2.9	1.8
Pro	92.5	17.9	19.8
Hypro	25.5	6.4	3.4
Hylys	2.7	n.n.	n.n.

Table 2: Amino acid concentration of hydrolyzed NPN (non-protein-nitrogen) in sample **1**, **2** and **3** of ham (mg/100 g).

Amino Acid	1	2	3
Asp	74.6	13.2	15.8
Thr	52.4	15.1	11.6
Ser	46.3	17.2	16.3
Glu	132.1	79.1	60.9
Gly	141.3	43.3	25.1
Ala	94.8	42.7	31.8
Val	56.2	14.0	11.2

Met	21.3	3.2	6.1
Ile	37.9	7.8	8.0
Leu	61.5	17.2	15.6
Tyr	32,7	8.9	9.7
Phe	28.6	9.7	9.2
His	306.1	312.2	296.4
Lys	107.4	26.8	21.0
Arg	76.8	17.9	12.6
Pro	83.7	25.9	16.4
Hypro	34.3	13.5	12.9
Hylys	5.9	n.n.	n.n.

For both type of samples the amino acid concentrations are increased in sample 1 in comparison with sample 2 and 3.

An addition of animal protein hydrolysate (gelatin) increases the amino acid concentrations of hydrolyzed NPN (non-protein-nitrogen). Especially the levels of hydroxyproline and hydroxylysine. They are markers for added gelatin in crème cheese and ham. When using gelatin a declaration in the list of ingredients is mandatory.

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