

### K20

#### TOTAL PHOSPHORUS AND PHOSPHATES CONTENTS IN MEAT PRODUCTS FROM THE BELGRADE MARKET, SERBIA

Danijela Vranic<sup>(1)</sup>, Radivoj Petronijevic<sup>(1)</sup>, Jasna Djinovic-Stojanovic<sup>(1)</sup>, Vesna Djordjevic<sup>(1)</sup>, Srdjan Stefanovic<sup>(1)</sup>, Vladimir Koricanac<sup>(1)</sup>, Dejana Trbovic<sup>(1)</sup>

<sup>1)</sup> Institute of Meat Hygiene and Technology, Serbia

\*Corresponding author - E-mail: danijela.vranic@inmes.rs

Phosphate additives have important role in manufacturing of meat products. They improve the safety and acceptability of meat products and extend shelf life. Inorganic phosphates used in meat industry are salts of phosphoric acid and their condensed forms (mono-, di-, tri- and polyphosphates). Current EU and national legislation on food additives authorized the most relevant group of phosphate additives as "phosphoric acid - phosphates - di-, tri- and polyphosphates" (E 338-452) in meat products up to 5000 mg/kg (0.5%), and the national regulation on meat products quality sets the permitted level of total phosphorus at less than 8 g/kg as P<sub>2</sub>O<sub>5</sub>. It is estimated that these additives are present in up to 65% of processed meat products. The specific measurement of additive-originating phosphates (although desirable) is currently not required by the legislation. The reason is difficulties of determination of phosphate origin due to their presence in biological tissues like meat, and limitations of analytical methodology. The most suitable method of ion chromatography (IC) cannot confirm origin of phosphates present in meat and, also, struggle to separate condensed phosphates higher than triphosphate. Calculation of added phosphates based on protein and total phosphorus determination are unusable if proteins of non-meat origin are present in product.

Total amount of 448 meat product were analysed. Total phosphorus, as P<sub>2</sub>O<sub>5</sub> (g/kg) and protein content were determined according to reference methods, and inorganic phosphates determination was performed by IC with conductometric detection. The highest average value of the total phosphorus content was found in smoked and dried meat products (6.31±1.11 g/kg), and the lowest in canned sausages (2.93±0.54 g/kg). Also, the highest content of inorganic phosphates, as P<sub>2</sub>O<sub>5</sub>, was found in smoked and dried meat products (3.37±1.10 g/kg) and, the lowest in the group of canned sausages (1.09±0.48 g/kg). In canned meat products and boiled sausages, average values for total phosphorus contents were 5.70 ±1.04 and 4.89±1.19 g/kg, respectively, while contents of inorganic phosphates were 3.14± 0.87 g/kg (canned meat products) and 2.39±0.94 g/kg (boiled sausages). Total phosphorus content was over the permitted value in two samples of boiled sausages (0.84%) and in one of smoked and dried meat products (1.58%) as well as inorganic phosphates content in the same product. In any case, it is important to monitor the use of phosphate content in meat products and ensure that levels are maintained below the limit, in terms of consumer health, but also in terms of quality and safety of the products.

**Keywords:** total phosphorus, phosphates, meat products, Serbian market

**Acknowledgement:** This study was supported by the Ministry of Science, Technological Development and Innovation, Republic of Serbia, Grant No. 451-03-66/2024-03/200050 from 05.02.2024.