**Proceedings template:**

**Histochemický průkaz hrachové bílkoviny**

***Histochemical Detection of Pea Protein***

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**Souhrn**

V masném průmyslu se z důvodu snížení ceny výrobků využívají jako náhrady masa rostlinné bílkoviny, z nichž některé mají alergenní účinek. Proto je v současné době snaha nahradit tyto alergeny jinými rostlinnými bílkoviny, které dle legislativy mezi alergeny nejsou řazeny. Mezi nejčastěji používané patří hrachová bílkovina, která ale také může způsobovat alergické reakce.…….

**Abstract**

The meat industry uses vegetable proteins as meat substitutes to reduce the price of its products. Some vegetable proteins, however, have allergenic effects. Efforts are therefore being made to replace such allergenic proteins with other vegetable proteins that are not classified as allergens by the legislation. The most commonly used include pea protein, though this may also cause allergic reactions.…….

**Key words:** *Plant proteins, pea flour, microscopy, histochemistry, ………*

**Introduction**

The current consumer’s food choices are influenced by product price. This is one of the reasons why the meat industry uses cheaper raw materials as meat substitutes (Modi *et al*., 2003). Various protein preparations, e.g. proteins of animal origin (blood plasma, collagen, milk protein) and vegetable origin (soybean, peas), are added to meat products (Kameník *et al.*, 2014). ………

**Material and methods**

Microscopic specimens were prepared from a pea-flour and protein sample and heat-treated (70 °C, 10 minutes) model samples with a 2.5 % addition of pea flour and protein. Salt (2.5 %) was also added to heat-treated model samples. Model samples were processed in the microscopic laboratory of the Department of Vegetable Foodstuffs Hygiene and Technology according to Standard Operating Procedures and were histochemically stained with haematoxylin-eosin (HE), PAS Calleja (PC) and Toluidine Blue (TB)……

**Results and discussion**

On the basis of photographs of flour samples (Fig 1–3), characteristic flour structures were demonstrated in model samples with added flour, such as palisade and goblet cells (Fig 4–6), fragments of cotyledon cells with starch granules, and cells containing pea protein as described in the literature (Hohmann, 2007)..……….

**Table 1:** Numbers of palisade cell fragments in heat-treated model samples with the addition of pea flour and protein per 1 cm2

|  |  |  |
| --- | --- | --- |
| **Stainig** | **Sample** | |
| **Samples with pea flour** | **Samples with pea protein** |
| **PC** | 2.75 ± 1.22 | 0 |
| **TM** | 1.54 ± 0.83 | 0 |
| **HE** | 1.50 ± 0.71 | 0 |

|  |
| --- |
| **200 µm** |
| **Figure 1:** palisade cells in pea flour, PC |

**Conclusion**

The results of our study indicate that PAS Calleja staining should be considered the most suitable histochemical staining for the detection of added pea flour as well as pea protein. This kind of staining produces results sufficiently distinguished by colour even for less experienced microscopists. Flour addition can be identified by the detection of palisade and goblet cells, which occurred in all sections, and also by the finding of starch granules…….

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