

## Functional Perspective of Products from Pears Cv. Pituralka

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**Abstract:** Pears cv. Pituralka are autochthon old cultivar from west Slovenian region and northern part of Italy, that were traditionally consumed as cooked or baked meals. In our study we developed new products and defined their nutritional value. Different thermal treatments (cooking and baking) were used for preservation of these products in sugar solution with or without an ascorbic or citric acid and packed in vacuum in a thermostable polyamide/polypropylene (PA/PP) foil. The products made from pears cv. Pituralka were sensory evaluated. The results show that Pituralka pears can be consumed only if they are thermally processed. Containing high amount of total fiber (6–7 g/100 g) products have functional perspective as prebiotics. Having low acidity level (total amount of acids 12.9–15.3 mg/100 g) products from pears cv. Pituralka have very acceptable sensory properties, especially for people with dyspepsia. However low amount of vitamin C (0.5 mg/100 g) has affect on higher sensitivity to oxidation, that needs to be taken into consideration during processing and storage.

**Keywords:** pears cv. Pituralka; autochthon cultivar; functional properties

### INTRODUCTION

Nowadays there is an increasing interest among consumers on how food products can contribute to their health. High intake of fruits and vegetables has been widely acknowledged in epidemiological research to have a protective effect against various cancers (BLOCK *et al.* 1992; JANSEN *et al.* 2004) and to provide protection against cardiovascular disease (EICHHOLZER *et al.* 2001; HUNG *et al.* 2004). The pears belong to the family of the Rosaceae and the genus *Pyrus*. *Pyrus communis* L. is considered to be European pear and most cultivated. This cultivar Pituralka are old autochthon pears which originate from west Slovenian region and northern part of Italy. Called Pera Volpina, which means foxy pear was carried out of anecdote, which asserts that foxes ate this pears through the winter. It was also found in southern part of Austria in Stajerska region, where is called Koh. Pituralka tree is vigorous, with wide crown and blossoms in last week of April. Furthermore is very productive and picking date is from end of October until middle November. Fruits are small, apple shaped,

3–5 cm in diameter, weighing up to 100 g. Thin, not smooth skin is greenish to brownish colour. Pears pulp is yellow-white colour, consistent and grainy structured (YOUSSEF *et al.* 2000). Raw pear cv. Pituralka tastes discreetly and due to high firmness they have to be processed. Traditionally were



Figure 1. Pears cv. Pituralka

consumed as cooked or baked meals. The aim of this study was to find the suitable mode to prolong the usage of pears cv. Pituralka, to develop some consumer acceptable new products and to define its nutritional value.

## MATERIAL AND METHODS

At harvest pears were analysed on: firmness, sugars, colour and starch content to define their optimal picking date and maturity parameters.

Pears were randomly picked in old orchards in Goriška Brda (Slovenia). Weighed and classified into two groups (lighter and heavier than 30 g). Their nutritional quality was measured by chemical and instrumental analysis of: sugars, sorbitol, vitamin C by HPLC method; fiber by Prosky gravimetric procedure. Total dietary fibre content was determined by the gravimetric method where the residue after starch removal is weighed to give a measure of total dietary fibre. The method is described in AOAC (Official method 982.29); total protein (crude protein,  $N \times 6.25$ ) content was assessed by the Kjeldahl method according to AOAC 928.08 (standard method); ash content was determined by mineralisation of samples at 550°C according to AOAC 920.153 (standard method) and organic acids by chemical titration. Different

thermic treatments (cooking and baking) were used for the preservation of pears. New products were prepared in sugar solution with or without ascorbic or citric acid, and packed in vacuum in a thermostable polyamide/polypropylene (PA/PP) foil (KIRWAN & STRAWBRIDGE 2003). The products made from pears cv. Pituralka were sensory evaluated.

## RESULTS AND DISCUSSION

Overall results are shown in Table 1. The results of mechanical and chemical analysis showed that pears cv. Pituralka are in raw state very hard, therefore they can be consumed only if they are thermally processed. Mechanical analysis was conducted to get to know physical properties of fruits. Firmness measurement showed exceptional hardness of pears pulp. Chemical analysis showed nutritional value of pears: starch test revealed that concentration of starch was negligible, which means that these pears were quite ripe, even though they were extremely hard. Moreover, analysis showed very low quantity of organic acids (15 mg/100 g) and vitamin C (0.4 mg/100 g) which has affect on higher sensitivity to oxidation, that needs to be taken into consideration during processing and storage. Prolonged storage has a reduced affect on vitamin C content. Sugar content was within expectations. Furthermore glucose fructose ratio was 1/3 as we predicted. Dietary fibre share was high (6–7 g/100 g) compared to other pears. On top of that we were especially interested in soluble dietary fibre, due to its health properties. The result showed that the older the species, the more dietary fiber contains. Mineral content was assessed by ash analysis and showed that pears cv. Pituralka has much higher mineral content comparing to other fruit species. Products made from pears cv. Pituralka were sensory evaluated.

## CONCLUSION

The products made from pears cv. Pituralka were sensory evaluated. Taking everything into consideration pears cv. Pituralka are not suitable for consumption in their raw form and need to be thermally processed. Containing high amount of total and soluble fibre has the potential of being prebiotic. On the other hand low amount of common acids and vitamin C conveys to oxidation sensitivity.

Table 1. Results of chemical and mechanical analysis

Analysis	Average
Water content (%)	83.8
Soluble solids (Brix %)	12.6
Firmness – digital penetrometer (kg/cm <sup>2</sup> )	10.7
Cutting value (N)	24.3
Starch test (1–10)	10
Acids (mg/100 g)	15.3
Glucose (g/100 g)	3.5
Fructose (g/100 g)	9.1
Sorbitol (g/100 g)	0.8
Vitamin C (mg/100 g)	0.4
Insoluble fibre (g/100 g)	4.9
Soluble fibre (g/100 g)	1.8
Total fibre (g/100 g)	6.7
Protein (%)	0.7
Ash (g/100 g)	1.4

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