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Stability of vitamin D in fish and mushrooms during different cooking procedures

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Introduction

Vitamin D is a group of fat-soluble sterols that come in several forms. The two major forms, which differ in their side chain construction (Fig.1), are cholecalciferol (vitamin D$_3$) found mainly in foodstuffs of animal origin, and ergocalciferol (vitamin D$_2$) which is found in certain fungi (mushrooms) and plants. There are very few studies which examine the changes in vitamin D content during cooking processing (1, 2). The information in food composition databases is primarily based on the content of vitamin D in raw food. Dietary intake of processed food needs to be corrected by the retention during the cooking process. Therefore, the purpose of the present study was to determine by HPLC-UV method the content of vitamin D$_2$ in rainbow trout and the content of vitamin D$_3$ in mushrooms after different cooking procedures. The retention of vitamin D during cooking procedures usually performed in households i.e. boiling, frying and baking was calculated by formula 1 (3).

Material

• Rainbow trout (Oncorhynchus mykiss)
• Champignon mushrooms (Agaricus bisporus)

The types of heat treatments used in this study are listed for trout in Table 1 and mushrooms in Table 2.

Results

The preparation conditions affected the degree of retention (p < 0.05) both in trout and mushrooms samples.
• Trout samples – high true retention (85-114%)
• Champignon samples – lower true retention (62-89%)
• Longer duration of heating procedure performed in champignon samples
• Acidic pH environment enabled preservation of vitamin D in samples which were cooked in a boiling water

Conclusions

Cooking may cause the significant loss of vitamin D but it depends on the foodstuffs and the kind of heating procedure. Further research has to be done to optimize cooking procedure to enhance retention of vitamin D. Changes in vitamin D retention during heat treatment should be taken into consideration in future calculations of dietary intake of vitamin D.

References