

# INFLUENCE OF DIFFERENT RAW MATERIALS POWDER ON NUTRITION VALUE OF YOGURT BITES

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## Introduction

One of the most popular fermented milk products is yoghurt. It contains a lot of high-quality protein, calcium, potassium, phosphorus, and vitamins.

Yogurt has a short shelf life when stored. Many methods have been used to extend the shelf life of yoghurt. The freeze-drying process is an effective way to extend the shelf life of yoghurt. The chemical quality of yogurt bites can be improved by adding plant raw material during the manufacturing process.

Yogurt snacks are usually enhanced with berries and fruit concentrates, but no yogurt snacks or bites enriched with freeze-dried mulberry leaves, beetroot, rosehip fruit or nettle leaves powder. According to literature, all of these raw materials are high in protein, carbohydrate, vitamin, microelement, and dietary fiber food sources.

Therefore, the aim of the research was to determine the influence of different raw materials powder additive on nutritional value of yogurt bites.



Fig 1. Yogurt bites enriched with different raw materials powder.

## Methodology

For preparing the yogurt bites were used Greek yogurt as well as it was enriched with different raw material powders. There were five treatments: 1. control (yogurt bites without raw materials); 2. yogurt bites with 1% rosehip fruit powders; 3. yogurt bites with 1% nettle leaves powder; 4. yogurt bites with 1% mulberry leaves powder; 5. yogurt bites with 1% beetroot powders.

The yogurt samples were placed in silicone molds, and immediately frozen at  $-35^{\circ}\text{C}$ . After 24 hours, the samples were lyophilized and was kept in sealed polyethylene bags until analysis.

The amounts of total sugar in yogurt bites were identified using a Standard Enzymatic Assay (Second Method). The total fat (%) in bites was established by LST AOAC922.06+AOAC 963.15:2003/1K:2013, total ash (%) was established by AOAC 930.30, 1990, 15 1, total protein (%) was established by LST EN ISO 8968-3:2007 and total carbohydrates were calculated by difference.

## Results

In this study, among all investigated yogurt bites, the significantly highest moisture content was founded in yogurt bites enriched with rosehip fruit powder, in comparison with yogurt bites without raw materials (Table 1).

Table 1. Proximate composition of yogurt bites.

	Control	YBB	YBM	YBN	YBR
Moisture (%)	4.31 ± 0.11 b	4.13 ± 0.11 b	4.31 ± 0.12 b	4.23 ± 0.13 b	4.76 ± 0.23 a
Protein (%)	13.72 ± 0.22 ab	13.84 ± 0.27 a	13.57 ± 0.32 ab	14.13 ± 0.26 a	13.05 ± 0.15 b
Carbohydrates (%)	46.66 ± 0.61 a	45.94 ± 0.83 a	46.66 ± 1.04 a	46.18 ± 0.71 a	46.77 ± 1.03 a
Ash (%)	3.31 ± 0.11 a	3.29 ± 0.10 a	3.46 ± 0.13 a	3.46 ± 0.12 a	3.42 ± 0.12 a
Total sugars mg 100 g <sup>-1</sup>	20.59 ± 0.99 b	21.37 ± 0.96 b	20.86 ± 0.85 b	20.64 ± 0.88 b	24.29 ± 1.03 a

Note: Different letters in the same line represent significant differences between samples ( $p < 0.05$ ).

Control -yogurt bites without raw materials, YBB - yogurt bites with 1% beetroot powders, YBM - yogurt bites with 1% mulberry leaves powder, YBN - yogurt bites with 1% nettle leaves powder, YBR - yogurt bites with 1% rosehip fruit powders.

The yogurt bites without raw materials and enriched with nettle leaves powder and beetroot powder had significantly highest amount of total protein. Furthermore, the carbohydrate amount in yogurt bites were unaffected by any additives used of the raw materials powder. As well as, the all used different raw materials powder additives in yogurt bites had no significant influence on total fat and total ash contents. The total sugar amount most abundant in the yogurt with rosehip fruit powder, and there were no significant differences between the other tested samples.

## Main conclusions

The rosehip fruit powder additive significantly increased the total sugar amount in yogurt bites, compared with control product. The addition of different raw materials powder has no significant effect on contents of moisture, protein, carbohydrates and ash of yogurt bites.

