



# Natural products application: Health, Cosmetic and Food

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**Book of abstracts**  
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## DEVELOPMENT OF ENERGY BARS WITH BEE POLLEN AND BEE BREAD

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Bee pollen and bee bread are two beehive products that have a high nutritional value, result of the presence of proteins, amino acids, fatty acids, carbohydrates, vitamins, minerals and phenolic compounds [1]. Therefore, these products can be considered as excellent ingredients for energy bars.

The study focused on the formulation of different energy bars with compositional variation of pollen and bee bread. Additionally, the composition included chestnuts, almonds, walnuts, hazelnuts, common in Trás-os-Montes region, and ingredients such as white quinoa, sesame and oat flake. Here we report the first stage of the study, namely the nutritional characteristics of all the raw materials and the sensory analysis of the energy bars. The results of the pollen analysis for bee pollen and bee bread, identified as the predominant origin the *Fabaceae* family (21%) and *Fagaceae* family (39%), respectively. In nutritional terms, bee pollen showed a higher content of moisture, proteins, fat, and energy when compared to bee bread. In opposition, the bee bread had a higher content of ash, fiber, and carbohydrates. The sugar profile for bee bread highlighted the high fructose content when compared to pollen. For the dry fruits, walnuts showed a high fat content, while almonds have presented high levels of protein and carbohydrates. The hazelnut, on the other hand, was characterized by its rich fiber and sucrose contents. Regarding seeds, the sesame seed exhibited the highest contents of ash, fat, protein, energy, and fiber. For the sugar profile, the seeds only contained sucrose, with the highest value found in white quinoa. According to a sensory analysis (**Table 1**), the panel acceptability was good for all the energy bars, with the two highest scores registered for the formulations containing pollen, particularly those with white quinoa/hazelnut and sesame seed/almond combinations.

**Table 1:** Sensorial analysis for the different energetic bars formulations, measure as general acceptancy.

Formulations of energy bars	Minimum	Maximum	Average	Formulations of energy bars	Minimum	Maximum	Average
Oat flake, pollen, walnut	3	8	4.9	Oat flake, bee bread, walnut	3	7	5.5
Oat flake, pollen, hazelnut	4	9	5.8	Oat flake, bee bread, hazelnut	4	8	6.7
Oat flake, pollen, almond	5	8	6.3	Oat flake, bee bread, almond	5	8	5.9
Sesame seed, pollen, walnut	3	8	6.0	Sesame seed, bee bread, walnut	4	9	6.4
Sesame seed, pollen, hazelnut	4	9	6.2	Sesame seed, bee bread, hazelnut	4	9	6.6
Sesame seed, pollen, almond	4	9	7.1	Sesame seed, bee bread, almond	4	9	6.4
White quinoa, pollen, walnut	3	9	6.3	White quinoa, bee bread, walnut	4	8	5.9
White quinoa, pollen, hazelnut	5	8	7.0	White quinoa, bee bread, hazelnut	4	8	6.7
White quinoa, pollen, almond	4	8	6.5	White quinoa, bee bread, almond	4	7	5.5

## References

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