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From Forest to Table: The Cultural, Nutritional, and Ecological Role of Acorns in Romania

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Ecologically, oak forests in Romania play a vital role in maintaining biodiversity and supporting wildlife.

Oak tree in Romania (*Fagaras Mountains area*)

(Romania-Insider.com/Pixabay)

The oak tree is known for the impressive age it can reach but it can be very sensitive to climate changes and the way it is managed.

Several oak species are found on Romania's territory:

- *Quercus robur* (pedunculate oak)
- *Quercus petraea* (sessile oak, gorunul in Romanian)
- *Quercus pedunculiflora* (Grayish oak)
- *Quercus pubescens* (the downy oak)
- *Quercus frainetto* (Hungarian oak or Italian oak)

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NOMENCLATURE, OCCURENCE, SOIL REQUIREMENTS AND USES OF ROMAINIAN OAKS

* Explanaition of Soil Requirements:
I - TROPHICITY: 1=poor; 2=middle; 3=rich; 0=wide variability
II - ACIDITY: 1=acid; 2=moderate acid; 3=weak acid; 4=neutral; 5=alkaline
III - HUMIDITY: 1=xerophyte; 2=mesoxerophyte; 3=mezophyte; 4=meschygrophyte; 5=hygrophyte; 0=wide

SCIENTIFIC AND COMMON NAMES	SYNONYMS	VARIABILITY	OCCURENCE		MAX. HEIGHT (FEET)	SOIL REQUIREMENTS*				TIMBER VALUE	AMENITY VALUE AND USES	OTHER REMARKS
			GENERAL	ROMANIA		I	II	III	TEXTURE			
Quercus petraea (Matl.) Liebl. (Sessile oak)	*Q. sessiliflora* salisl. *Q. sessilis* Ehrh.	-ssp. *petraea* -ssp. *polycarpa* (Schur.) 500' -ssp. *dalenchampii* (Ten.) 500' -climate and edaphic ecotypes	Europe Carpath-Balk.-Caucas. Alps-Carpath.-Balkan	-hills & piedmonts -pure and mixed stands	100(130) 85 100	0 0 0	2-3 2-3 1-3	3(4) 2 2-3	coarse	good & remarkable (some provenances)	-subf. *mespilifolia* (Wall.) Schw. -f. *lacimata* -f. *longifolia* - seldom cultivated in parks	-deep, drained soils -shallow or skeleton soils -shallow or skeleton soils
Quercus robur L. (English Oak)	*Q. pedunculata* Ehrh.	-v.*landiflora* Czern -var *praecox* Czern -var. *robur* -var. *puberula* -great variability of leaves, acorns & habit	Europe	-plain....hills -pure and mixed stands	130(165)	0	1-4	0	loamy-sandy.... sandy-loamy	good & remarkable (some provenances)	-f. *fastigiata* (Lam.) Schw. - used in parks as as single tree or in groups	-deep, loose, drained soils
Quercus cerris L. (Turkey oak)			Mediterranean	-forest steppe.... hills -pure and mixed stands	100(130)	0	1-3	1-2	sandy-loamy...clayey	good - medium (forms with white heartwood better than red ones)	- seldom cultivated	- compact or dense soils
Quercus frainetto Ten. (Hungarian oak)	*Q. conferta* kit		Balkan	-forest steppe.... hills -mixed (seldom pure) stands	130	0	1-3	1-2	sandy-loamy....clayey	good	-extremely decorative	-compact or dense soils
Q. pedunculiflora C. Koch (Greyish oak)		-var. *pedunculiflora* Schuz. -var. *virescens* C. Koch	Pontic(around Black Sea)	-forest steppe - pure and mixed stands	130	3	3-4	2	medium coarse	good	-seldom cultivated	-loose, sandy soils -subthermic sp., identified & described by Alex. Borza (1936)
Q. pubescens Willd. (Pubescent oak)	*Q. lanuginosa* Thuill.		Meditteranean	-forest steppe.... hills -open stands, shrub size	13-50 (65)	2-3	4-5	1	sandy-loamy.... clayed loamy	insignificant		- skeleton, calcic soils -subthermic sp.
Q. virgiliana Ten.			Mediterranean	-forest seppe.... hills -open stands, shrub size	65	2-3	4-5		sandy-loamy.... clayed loamy	reduced		-skeleton, calcic soils -subthermic - thermic sp.

(Source: https://www.internationaloaksociety.org/)

Because of human intervention and use of the tree, the distribution of the oak recorded widespread changes compared to the structure of the original forests.

In **Romania**, it is found in the

- southern part of the country (Piteşti, Alexandria-Comana-Mizil),
- western plains,
- north-eastern Moldavia and
- central Transylvania.

Some isolated trees can be found as high up as 900 meters, in Bihor Mountains, for instance,
but the tree's upper limit does not go beyond 600 – 700 meters.

The Cultural Significance of Acorns in Romania

Historical Context

- Acorns have been a part of the human diet for thousands of years, particularly in pre-agrarian societies.
- In Romanian history, acorns were used during food shortages and integrated into traditional diets in rural communities.

Folklore and Symbolism

- The oak tree (*Quercus* species) is a sacred symbol in Romanian folklore, often associated with strength, longevity, and resilience.
- Acorns, as fruits of the oak, were seen as symbols of survival and resourcefulness.

Traditional Uses

- Villagers in forested areas used acorns for food, such as flour for bread and porridges.
- Acorns were also utilized for medicinal and animal fodder purposes, reflecting their versatility.

Nutritional and Culinary Value of Acorns

Nutritional Profile

- Acorns are rich in complex carbohydrates, healthy fats, proteins, and fiber.
- They contain vitamins such as B6, potassium, magnesium, and antioxidants.
- The tannin content (when properly processed) gives acorns their unique properties, with potential health benefits such as anti-inflammatory and antioxidant effects.
- Literature indicates that acorn flour has a higher fat content (11.39%) than flours from rice, corn, sorghum, and buckwheat, and its oil is comparable to extra virgin olive oil in phenolic content.

Culinary Applications

- Traditional preparation methods include leaching to remove tannins, followed by drying, grinding, or roasting.
- Acorn flour can be used to make bread, biscuits, and porridges, offering a gluten-free and nutrient-dense option.
- Modern chefs and artisanal producers in Romania are reviving acorns as sustainable, locally-sourced ingredients.

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In Romania, acorns have been used in the past, and there are several examples of their valorisation, both for traditional food purposes and in modern initiatives.

Acorn Coffee

- In rural regions, **acorn coffee** was popular during times of scarcity, replacing regular coffee.
- It is prepared by **drying, roasting, and grinding acorns**, and the resulting drink is a caffeine-free alternative appreciated for its digestive and nutritional properties.
- It was particularly consumed by children or people with gastric issues.

Acorn Flour

- Traditionally, acorn flour was used to **bake bread** or other bakery products during times of famine.
- Although it is less common today, a few modern initiatives promote acorn flour as an alternative ingredient rich in nutrients.
- The flour can be used in **biscuits, cakes, or pasta**, often mixed with other types of flour to reduce its bitter taste.

Acorn Oil

- Though less known, acorns can be a source of **vegetable oil**. This oil is used in some artisanal projects in Romania for **culinary** or cosmetic purposes.
- It has a content of beneficial fats and can be used for cooking or in skin care products.

Introducing acorn flour into the human diet

Preparation of Sweets

- There have been efforts to valorize acorns through **traditional or modern sweets**, such as energy bars or **gluten-free cakes**, using acorn flour as a base.
- Due to their nutritional content (complex carbohydrates, fiber, and healthy fats), acorns can be integrated into innovative recipes for **vegan** or allergen-free products.

Case study - PhD Thesis 2 0 2 4
(IOSUD-USV Timisoara, Romania)

- A total of 845 grams of acorns were collected, yielding 514 grams of kernels (ground to produce biscuits).
- Samples included two controls—100% acorn flour and 100% wheat flour—and mixtures with 10% to 90% acorn flour.
- Biscuits made with 100% wheat flour had the highest protein content, which decreased as the percentage of acorn flour increased.
- Similar trends were observed for nitrogen.
- Potassium levels were relatively consistent, with slight increases observed in some samples.
- The highest copper (Cu) and manganese (Mn) levels were found in ground acorn flour and 100% acorn flour biscuits, while ground acorn flour had the highest levels of Zn, Fe, Ni, Mg, and Ca.
- Sodium (Na) content was lowest in both ground acorn flour and 100% acorn flour biscuits.

(Source: https://www.usab-tm.ro/utilizatori/universitate/file/doctorat/sustinere_td/2024/rosu%20simona/Rezumatul%20tezei.pdf)

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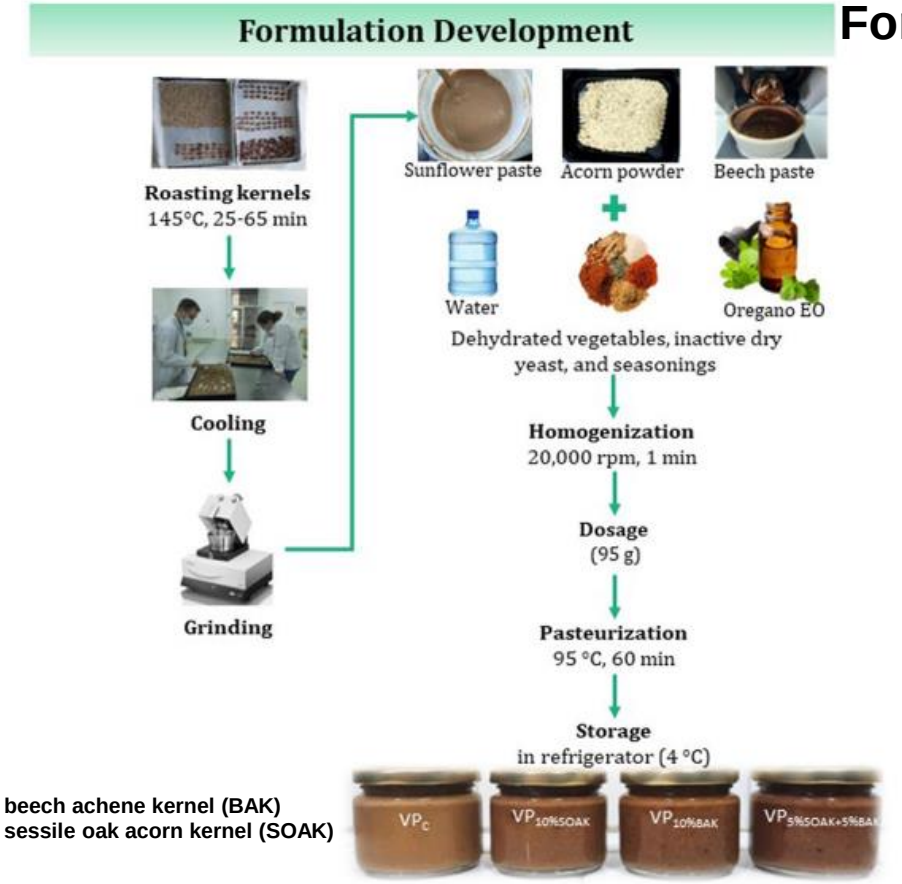
Case study – publication 2023
(University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Romania)



beech achene kernel (BAK)
sessile oak acorn kernel (SOAK)

Formulation of plant-based alternatives to pâté using forest ingredients

- Formulation with 10% SOAK powder is characterized by a higher protein and lipid content than the control sample but with lower carbohydrates, ash, and energy value; it also has a lower pH and colour intensity but a higher syneresis.
- 10% BAK paste formulation has a higher lipid and ash content but fewer protein and carbohydrates than the control sample, nevertheless a higher energy value; also, an increased syneresis and reduced colour intensity.
- Formulation with the mixture of 5% SOAK powder and 5% BAK paste has a higher content of lipids and carbohydrates than the control sample, respectively, energy value; at the same time, a lower pH and colour intensity buta higher syneresis.

Forest ingredients are used in appropriate concentrations, vegetable pastes based on BAK and SOAK can be promising alternatives to liver pâté.

Sources:
Socaciu MI, et al. J Food Sci Technol. 2023 doi: 10.1007/s13197-023-05852-7
Socaciu MI, et al. FoodChemistry 2023. doi.org/10.1016/j.foodchem.2022.135053

Introducing acorn flour into the animals diet

- Acorns are a natural food source for **wild species** such as the Carpathian bear, which has an omnivorous diet that includes plants (beech mast, acorns, chestnuts, berries), insects, and small mammals.

- Although acorns can be used in the feeding of certain animals, it is essential to consider the species they are intended for and the quantities administered, given the potential toxic effects of the tannins they contain.

- In the case of **pigs**, acorns were traditionally used as a supplementary food, especially in forested areas where they were abundantly available. However, due to their tannin content, it is recommended that acorns be offered in limited quantities and, preferably, after a preparation process that reduces the tannin level, such as boiling or soaking.

- For other **domestic animals**, such as dogs, horses, cattle, sheep, and goats, acorns are extremely harmful and should not be administered in any form. Ingesting acorns can lead to symptoms of poisoning, such as weakness, loss of appetite, excessive salivation, nausea, and gastrointestinal issues. In severe cases, liver and kidney damage can occur, which may be fatal.

Case study – project ongoing
(University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Romania)

University of Agricultural Sciences and Veterinary Medicine in Cluj-Napoca - research on the use of acorns and other food sources for animals. (No results yet published)

National funded project:

Developing dietary supplements from

snails, acorns, and beech mast, for the swine species, compared to traditional feed

Introducing acorn extracts into health benefit commercial products available

Oak acorn extract

Brand: PLANTEXTRAKT

Exo Snack - for Rodents Made from Dried Acorns

Brand: Exotic-K

Revalorization in Romania can have significant economic, cultural, and ecological potential

The use of acorns is still limited in Romania and less widespread, but there is growing interest among local producers and researchers to explore the benefits of acorns and other natural ingredients as alternative sources of food or personal care products.

Educational Projects and Local Initiatives

- In rural areas, especially near oak forests, acorns are promoted as a **sustainable resource** for consumption and ecological education.
- During certain **local festivals** or events with a traditional theme, acorns are used to revive old recipes and educate the public about their potential.

Modern Initiative Examples

- **Ecological and sustainable projects** exploring the use of acorns in food as a local, natural, and renewable resource.
- **Promotional efforts in gastronomy** – some chefs or enthusiasts of traditional cuisine have reintroduced acorns in creative dishes, such as artisanal bread or reinterpreted desserts.


Thank you for your attention!
Merry Christmas and Happy New Year!