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# SPRINGS

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## CULTURES OF TARHANA: A TALE OF HUMANS AND MICROBES

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*The entire house was permeated with a smell reminiscent of fresh sourdough. It was the first thing that greeted you—the herald of a warm wintertime soup in the making: tarhana. In autumn, the scent of tarhana preparation, a process lasting three weeks, envelops many village homes in Turkey, Cyprus, and Bosnia. When you open the door to the room where tarhana base is spread out to dry, the sharp smell hits you and serves as a vivid reminder of its special place in culture.*



Tarhana base and soup. © Grandbrothers on Adobe Stock. All rights reserved.

The cultures of tarhana—a fermented instant soup base—come with a long-practiced culinary tradition in the Middle East and the Balkans.<sup>1</sup> Although often dubbed the “poor man’s soup,” tarhana is much more than just a soup; it is a fermented staple that has preserved and transmitted distinct flavours, culinary skills, and cultural heritages across generations. While conducting ethnographic research on fermentation practices in Bulgaria and Turkey, I’ve learnt to appreciate the prevalence and diversity of tarhana traditions.<sup>2</sup> I began to see that “cultures” of tarhana encompass not only live fermentation starters, where microbes play a specific role, but also the rich traditions and practices surrounding this staple.

As fermentation practices weave invisible microbial, traditional, and imaginative threads together, they provide fertile ground for exploring these intertwined cultures of tarhana across three layers. The first layer hosts microbial cultures that have been passed down through generations and spread across locations. Here, fermentation emerges as a “coevolutionary force,”<sup>3</sup> selecting the microbes that both shape and are shaped by tarhana practices. The second layer holds traditional skills and knowledge as diverse as the variety of fermented products they yield. And the third layer harbours



culinary heritages that have the potential to inspire sustainable paths amidst the fading of traditional foodways.

## Coevolving with Microbes

The cultural prominence of tarhana is engrained in a deep history.<sup>4</sup> As its tart scent suggests, its fermentation process is akin to that of sourdough bread. Both involve cereal fermentation facilitated by yeast and lactic-acid bacteria.<sup>5</sup> Despite numerous varieties of tarhana,<sup>6</sup> almost all of them share three common ingredients: finely milled grains (predominantly wheat), yogurt, and the collective labour of both nonhumans and humans.



Preparing tarhana dough. © tolgaldun on iStock. All rights reserved.

Within the *long-durée* history of human-microbe partnerships, two ingredients of tarhana are particularly noteworthy: yogurt—recognised as the oldest fermented dairy product,<sup>7</sup> and wheat—integral to other ancient, fermented products like beer and bread.<sup>8</sup>

The microbial side of tarhana's story begins with two starter cultures: yogurt and previous tarhana batches. Flour, cooked vegetables, and spices are then mixed with these cultures, which are teeming with the yeast and bacteria that enable tarhana's metamorphosis.<sup>9</sup> The lactic-acid fermentation of cereals that characterises this stage imparts a distinctive sour taste to tarhana, just as it does to sourdough bread, intertwining their flavours and fermentation tales. During its week-long fermentation, tarhana is mixed daily by hand, its transformation carefully observed.

What distinguishes tarhana from sourdough bread is its two-week drying stage. The dough is divided into small pieces and spread out on cotton sheets. This phase slows down tarhana's transformation and enhances its flavour and longevity. As a result, dry tarhana can be stored for

many years, much longer than bread, making it an ideal provision for winter. By adding water, the dry mixture can be quickly cooked into a nutritious soup. These qualities are plausibly what have made tarhana an indispensable food for nomadic societies in the western Eurasia, who travel seasonally to find grazing land for their herds and therefore benefit from nonperishable food.

Fermented foods evolved alongside the domestication of plants and animals in preagricultural times.<sup>10</sup> Throughout the long history of human-microbe collaborations, each culture has developed its own unique methods of fermentation.<sup>11</sup> These traditions have become the cornerstones of culinary practices globally.<sup>12</sup> Until recently, fermentation was the primary method of preserving food, and it still contributes to a significant portion of our diet.<sup>13</sup> Bread, wine, and cheese are just a few gifts from those collaborations, with the ecological diversity of each region reflected in the different flavours of fermented products.<sup>14</sup> Tarhana likely emerged from such ancient foodscapes, blending yogurt—itsself a fermented product—and wheat—two foundational components of early fermentation practices in the Fertile Crescent.

The recurring fermentation practices in the long term set the stage for a coevolutionary process that leads to “successive changes in two or more ecologically interdependent species.”<sup>15</sup> From a biological perspective, such changes are genetically traceable in both humans and the microbial species involved in the fermentation practices.<sup>16</sup>



Tarhana dough after resting for about a week. © Sevgi Mutlu Sirakova. All rights reserved.



(Left) Divided tarhana dough waiting to dry. (Right) Breaking the drying tarhana into smaller pieces. © Sevgi Mutlu Sirakova. All rights reserved.

It is even more fascinating to consider how fermentation practices, such as making tarhana, not only influence the microbes involved but also inform the microbes’ evolutionary selection. These practices serve as a form of “niche construction” for the microbes;<sup>17</sup> humans actively control fermentation ecologies by altering environmental conditions, such as temperature, nutritional content, and oxygen level. Our species guides microbial successions to favour beneficial microbes and suppress harmful ones.<sup>18</sup>



Every act of fermentation requires skills and traditions to create ecological niches suitable for microbial selections. The repetitive and adaptive nature of these practices creates persistent selective ecologies, which potentially pave the way for the domestication of microbes. Sensing and interacting with microbial ecologies is crucial for guiding microbial successions.<sup>19</sup> And this requires mastery; without the skills to navigate microbial possibilities, the endeavour may easily fail.

When we consider how humans benefit from relationships with microbes in fermentation, it is conceivable that certain microbes have been domesticated via these practices.<sup>20</sup> However, this relationship is not one-sided; the selected microbes, in turn, produce the flavours we desire, making the interaction inherently interdependent. In terms of evolutionary strategy, we should also acknowledge that microbes have effectively been using us to ensure their genes are transmitted across generations.

As evolutionary ecologist Rob Dunn posits, yeast—a key fermentation agent in bread and beer (and we may add tarhana)—has essentially domesticated humans.<sup>21</sup> It is through yeast that cereals became a staple in our diet. This perspective is based on the evolutionary concept of domestication, which requires significant genetic adaptation over time.<sup>22</sup> When we compare the evolution of human and yeast traits, it appears that human genes have undergone a certain level of change in this coevolutionary tale,<sup>23</sup> while the yeast genome has remained relatively unchanged.



Dried and granulated tarhana ready for storage. (Left) © Busranur Cebi on iStock. All rights reserved. (Right) © Sevgi Mutlu Sirakova. All rights reserved.

## Enduring Traditions of Tarhana

Fermentation traditions embed rituals into tarhana's ecologies that allow microbes, stories, and imaginations of tarhana to travel and transform with each preparation. This coevolution is reflected in the various regional names for what in Turkish is called *tarhana*, including *tarkhana* in Armenian, *tarkhineh* in Persian, *tarxane* in Kurdish, *trahanas* in Greek, *tarhonya* in Hungarian, and *tarana* in Serbo-Croatian.<sup>24</sup>

Research examining the linguistic origins of *tarhana* explores its potential evolution in the Hittite and Byzantine periods and underscores the complexity of its heritage.<sup>25</sup> These studies suggest that the various names for tarhana share a common ancestor, perhaps as ancient as the common ancestor of their microbial cultures.

It is commonly accepted that “tarhana” originates from the Persian *tarχ<sup>w</sup>āne* (ترخوانه), meaning “soup made from dried yogurt.”<sup>26</sup> This term combines the Persian words *tar* (تر), meaning “wet or soaked,” and *χ<sup>w</sup>ān* (خوان), meaning “table, dining place” or “large wooden bowl.”<sup>27</sup> The name itself therefore reflects the soup’s preparation method, which involves soaking dry tarhana in water before cooking.

The widespread consumption of tarhana across various geographies further reveals the growth of its coevolutionary tree, while its biocultural coevolution is truly manifested in its diverse additional ingredients. As tarhana traversed regions, each community imbued it with local flavours, incorporating ingredients such as wild plums, cherries, resin, or meat.<sup>28</sup> Thus, tarhana is geographically specific, enriched by each locality’s offerings. Turkey alone is said to have over 50 different varieties of tarhana.



Three types of tarhana from Turkey: sour tarhana on the left, tarhana chips (Çerez Tarhana) at the top and bottom, and chunky (Topak) tarhana on the right. © Sevgi Mutlu Sirakova. All rights reserved.

The richness of tarhana then stems not only from what it is made of but also from how it is made. For example, Topak tarhana is traditionally sun-dried, particularly in the southern regions, while some types of powdered tarhana are commonly dried indoors, away from the sun—a method typically adopted in cooler and rainier climates. Documenting endangered culinary heritage, the Slow Food movement’s “Ark of Taste” highlights tarhana for its diversity. Seven tarhanas are listed—made from goat, sheep, and cow yogurt as well as different local spices and vegetables, with considerable variation in their physical form, ranging from powdered to chip-like shapes. Although the practice of tarhana-making is in decline, it remains prevalent as a means of winter-food provisioning, particularly in rural areas of the Middle East and the Balkans.

## The Futures of Tarhana

Fermented foods are not merely culinary products; they are vibrant archives that transmit recipes, tastes, and microbes across generations.<sup>29</sup> Each type of tarhana holds the story of its microbial and traditional cultures. These stories impart the knowledge and skills needed to cultivate and nurture the microbial diversity that enriches our lives.<sup>30</sup> Fermentation practices are inherently about the preservation and continuity of these cultures. Throughout human history, these have been the bedrock of food security, helping communities survive countless crises. When we consider some varieties of tarhana as endangered, it signifies more than just the disappearance of a food—it diminishes the prospects of collaborative ways of surviving.

This concern unfolds in three distinct ways. Firstly, we risk losing a significant portion of food diversity, which is essential for preserving biodiversity on a global and microbial scale.<sup>31</sup> Ironically, the decline of these practices comes at a time when we need their guidance more than ever, in an age marked by extinctions. Secondly, tarhana's diversity transcends mere numbers: it embodies practices, recipes, and rituals that engage with its sensorial aspects, enabling multispecies collaborations amidst the tide of homogenisation. And, thirdly, losing this diversity means losing the capacities for resistance—including the microbial diversity and flavours they foster, which have been crucial for our health and coexistence.<sup>32</sup>

Envisioning the future of our food, then, demands that we grasp the tales tarhana holds. To offer you a warm bowl of tarhana soup would be a satisfying conclusion to this exploration. As that is not possible, I will instead share my family's recipe from the Balkans with you. To truly experience the cultural richness of tarhana, I encourage you to seek out a friend from the Balkans or the Middle East and listen to their stories.



## The Author's Tarhana Recipe



Tarhana soup ready to eat. © alpaksoy on iStock. All rights reserved.

### Ingredients for 5 kg tarhana:

- 0.5 kg yogurt (cow, sheep, or goat)
- 250 g of last year's tarhana (to initiate fermentation)
- 0.5 kg tomatoes
- 2 kg peppers
- 1-2 onions
- ca. 3 kg white flour (or as much as the dough can absorb)
- dry thyme, chili pepper, mint (according to taste)

### Stage 1: Setting the Conditions

To initiate fermentation, mix last year's tarhana into yogurt the night before you plan to process it. Leave it out at room temperature to sour. You will need half a kilo of yogurt to yield five kilograms of tarhana, which will be sufficient to serve a family of five for a year.

Finely chop the vegetables the following day. The types of vegetables added vary by region. In the Balkans, we use tomatoes, peppers, and onions. Boil the chopped vegetables in water (ca. 500

millilitres). Once softened, blend them thoroughly. Add as much flour as the purée can absorb and knead in the soured tarhana-yogurt mixture. Season with dry thyme, chili pepper, and mint.

### Stage 2: Resting the Relations

Cover the dough with a moist cotton cloth to prevent it from drying out and leave it to ferment for about a week. The rising dough needs to be stirred daily by hand to ensure even fermentation. If necessary, add more flour. Once smell and texture are satisfactory (similar to that of sourdough bread), divide the dough into small pieces and spread them on a clean cotton sheet.

### Stage 3: Aging the Taste

Leave the dough pieces to dry for five to seven days in a well-ventilated room that is not exposed to direct sunlight. Turn the pieces over daily and break them into smaller ones by hand. Once thoroughly dried, crush and granulate these smaller pieces manually. Store the powdered tarhana in cotton bags or in glass containers for later use.

### Consumption Stage: Enjoying Tarhana

To prepare the soup, leave the dry tarhana to soak in warm water overnight (50 gramstarhana with 150 grams of water). One tablespoon of the dry mixture will suffice for each serving.

This is optional, but you may lightly fry *kavurma* (meat sautéed in its own fat and preserved), or onions and tomato paste in butter or vegetable oil. Add water to the ingredients (one bowl per person) and then gradually mix in and cook the dissolved tarhana. Add as much water as needed and leave to simmer. Sprinkle the soup with dried chili, thyme, and mint before serving. The finished soup is thick and has a sour flavour. It is delicious with grated *kaşar* (a medium-hard cheese) or crumbled white cheese (similar to feta).



Tarhana vegetables cooked in a cauldron. © Sevgi Mutlu Sirakova. All rights reserved.

*Afiyet olsun!*

## Acknowledgements

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### Notes

<sup>1</sup> I first experienced tarhana practices in a small Turkish village nestled in Bulgaria's Rhodope Mountains, where I grew up. The invaluable knowledge of traditional fermentation practices, passed down by my family and relatives, inspired this article and continues to shape my academic research.

<sup>2</sup> Details about my multi-sited ethnographic fieldwork can be found in "Connected Food: Preserving Traditional Food Practices via Portable Foods," in *Portable Food: Proceedings of the Oxford Symposium on Food and Cookery 2022*, ed. Mark McWilliam (Prospect Books, 2023).

- <sup>3</sup> Sandor Ellix Katz, "Fermentation as a Co-evolutionary Force," in *Cured, Smoked, and Fermented: Proceedings of the Oxford Symposium on Food and Cookery 2010*, ed. Helen Saberi (Prospect Books, 2011).
- <sup>4</sup> Ahmet Uhri, "Tarhana and Keşkek: Origins and Affiliations," *Petits Propos Culinaires* 104 (2015): 49-58.
- <sup>5</sup> S. Özdemir, D. Gocmen, and A. Yildirim Kumral, "A Traditional Turkish Fermented Cereal Food: Tarhana," *Food Reviews International* 23, no. 2 (February 2007): 107-21, <https://doi.org/10.1080/87559120701224923>.
- <sup>6</sup> Fatma Coşkun, "History of Tarhana and Varieties of Tarhana in Turkey," *Electronic Journal of Food Technologies* 9, no. 3 (2014): 69-79.
- <sup>7</sup> Eva Rosenstock, Julia Ebert, and Alisa Scheibner, "Cultured Milk: Fermented Dairy Foods Along the Southwest Asian-European Neolithic Trajectory," *Current Anthropology* 62, no. S24 (2021): S256-75, <https://doi.org/10.1086/714961>.
- <sup>8</sup> Solomon H. Katz and Mary M. Voigt, "Bread and Beer," *Expedition* 28, no. 2 (July 1986): 23-34, p. 23, <https://www.penn.museum/documents/publications/expedition/28-2/Bread.pdf>.
- <sup>9</sup> I use "microbes" to refer to the bacteria, yeast, and other microorganisms involved in fermentation. These can come from various sources, including a previous batch of tarhana and yogurt, both of which already contain some microbes. Unlike controlled industrial methods that use specific lab-grown species, traditional fermentation practices involve more diverse and complex microbial communities, making it harder to pinpoint exact processes and species.
- <sup>10</sup> Rob Dunn and Monica Sanchez, *Delicious: The Evolution of Flavor and How It Made Us Human* (Princeton University Press, 2021).
- <sup>11</sup> Sandor Ellix Katz, *The Art of Fermentation: An In-Depth Exploration of Essential Concepts and Processes from Around the World* (Chelsea Green Publishing, 2012).
- <sup>12</sup> Jyoti Prakash Tamang and Kasipathy Kailasapathy, eds., *Fermented Foods and Beverages of the World* (CRC Press, 2010).
- <sup>13</sup> Geoffrey Campbell-Platt, "Fermented Foods: A World Perspective," *Food Research International* 27, no. 3 (1994): 253-57, [https://doi.org/10.1016/0963-9969\(94\)90093-0](https://doi.org/10.1016/0963-9969(94)90093-0).
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- <sup>15</sup> *Merriam-Webster Dictionary*, "coevolution," accessed 28 November 2023, <https://www.merriam-webster.com/dictionary/coevolution>.
- <sup>16</sup> Michael J. Wade, "The Co-evolutionary Genetics of Ecological Communities," *Nature Reviews Genetics* 8, no. 3 (2007): 185-95. <https://doi.org/10.1038/nrg2031>.
- <sup>17</sup> "Niche construction is the process whereby organisms, through their activities and choices, modify their own and each other's niches. Examples of niche construction include the building of nests, burrows, and mounds and alteration of physical and chemical conditions by animals, and the creation of shade, influencing of wind speed, and alteration of nutrient cycling by plants." Kevin Laland, "Niche Construction," in *Oxford Bibliographies in Ecology* (Oxford University Press), last reviewed 24 November 2020, last modified 24 November 2020, <https://doi.org/10.1093/OBO/9780199941728-0089>. For theoretical and empirical research on this topic, see Kevin Laland, Blake Matthews, and Marcus W. Feldman, "An Introduction to Niche Construction Theory," *Evolutionary Ecology* 30 (2016): 191-202, <https://doi.org/doi:10.1007/s10682-016-9821-z>.
- <sup>18</sup> For example, *Lactobacillus* bacteria found in yogurt, sauerkraut, and other lactic-acid fermented foods play a crucial role by converting sugars into lactic acid. This acidification acts as a natural preservative, suppressing the growth and survival of undesirable microorganisms. While we aim to harness beneficial microbes and inhibit those that could spoil the process, the distinction is not always clear. It varies significantly across different societies, where what is considered beneficial or desirable in one might be viewed as unpleasant or even disgusting in another—some cheeses are a good example of this. For further discussion, see Robert Scott and William C. Sullivan, "Ecology of Fermented Foods," *Human Ecology Review* 15, no. 1 (2008): 25-31, <http://www.jstor.org/stable/24707481>.
- <sup>19</sup> Maya Hey, "Attunement and Multispecies Communication in Fermentation," *Feminist Philosophy Quarterly* 7, no. 3 (2021): article 4, <https://doi.org/10.5206/fpq/2021.3.10846>.
- <sup>20</sup> John G. Gibbons and David C. Rinker, "The Genomics of Microbial Domestication in the Fermented Food Environment," *Current Opinion in Genetics & Development* 35 (2015): 1-8, <https://doi.org/10.1016/j.gde.2015.07.003>.



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- <sup>21</sup> Rob Dunn, "The Microorganism That Shaped Humanity," *IAI news*, 17 August 2023, <https://iai.tv/articles/rob-dunn-the-microorganism-that-shaped-humanity-aid-2543>.
- <sup>22</sup> For the history and domestication of yeast, see Caitlin Lahue, Anne A. Madden, Robert R. Dunn, and Caiti Smukowski Heil, "History and Domestication of *Saccharomyces cerevisiae* in Bread Baking," *Frontiers in Genetics* 11 (2020): 584718. <https://doi.org/10.3389/fgene.2020.584718>.
- <sup>23</sup> Matthew A. Carrigan, Oleg Uryasev, Carole B. Frye, Blair L. Eckman, Candace R. Myers, Thomas D. Hurley, and Steven A. Benner, "Hominids Adapted to Metabolize Ethanol Long Before Human-Directed Fermentation," *Proceedings of the National Academy of Sciences* 112, no. 2 (2015): 458–63. <https://doi.org/10.1073/pnas.1404167111>.
- <sup>24</sup> Wikipedia, "Tarhana," last modified 7 September 2024, <https://en.wikipedia.org/wiki/Tarhana>.
- <sup>25</sup> Ali Güveloğlu, "An Approach on Tarhana and Its Similarity to Hittite Word GAtarašganna," *Tarih ve Gelecek Dergisi (Journal of History and Future)* 5, no. 1 (April 2019): 110–21, <https://doi.org/10.21551/jhf.549966>; Anthony Bryer, "Byzantine Porridge," in *Studies in Medieval History: Presented to RHC Davis*, ed. R.I. Moore and Henry Mayr-Harting (Bloomsbury Publishing, 1985).
- <sup>26</sup> Sevan Nişanyan, "Tarhana," *Nişanyan Sözlük: Çağdaş Türkçenin Etimolojisi*, last modified 25 June 2022, <https://www.nisanyansozluk.com/kelime/tarhana>.
- <sup>27</sup> "Tarkhine: Ark of Taste," Slow Food Foundation for Biodiversity, accessed 15 April 2023, <https://www.fondazione Slow Food.com/en/ark-of-taste-slow-food/tarkhine-2/>.
- <sup>28</sup> Coşkun, "History of Tarhana and Varieties of Tarhana."
- <sup>29</sup> Björn Reichhardt, Zoljargal Enkh-Amgalan, Christina Warinner, and Matthäus Rest, "Enduring Cycles: Documenting Dairying in Mongolia and the Alps," *Current Anthropology* 62, no. S24 (2021): S343–S348, <https://doi.org/10.1086/716065>.
- <sup>30</sup> Sevgi Mutlu Sirakova, "Forgotten Stories of Yogurt: Cultivating Multispecies Wisdom," *Journal of Ethnobiology* 43, no. 3 (2023): 250–61, <https://doi.org/10.1177/0278077123119477>.
- <sup>31</sup> Matthäus Rest, "Preserving the Microbial Commons: Intersections of Ancient DNA, Cheese Making, and Bioprospecting," *Current Anthropology* 62, no. S24 (2021): S349–S360, <https://doi.org/10.1086/715810>.
- <sup>32</sup> Salla Sariola, "Fermentation in Post-antibiotic Worlds: Tuning in to Sourdough Workshops in Finland," *Current Anthropology* 62, no. S24 (2021): S388–98, <https://doi.org/10.1086/715208>.



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