CHAPTER 1

Introduction

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Traditional medicine, which is a mixture of skills, wisdom, knowledge, and practices, is based on experiences and beliefs of native culture. The main aspects of treatments in this kind of medicine are hygiene and nutrition. The Middle East, particularly Persia, is proud of famous medical scientists such as Avicenna, Ibn Sina (CE 980–1037), and Mohammad Ibn Zakaria Razi, Rhazes (CE 865–925), who made the country distinguished with a heritage of ancient health-promoting remedies including ethnic foods. Razi, more than 12 centuries ago, considered the nutritional effect of foods as well as the modified diet as prescribed remedial treatment. Recently, it has been revealed that the term medicinal foods in the traditional medical sciences of Iran is very close to the definition of functional foods in modern medical sciences.

Food processing practices are generally used to convert naturally available food sources to safe, wholesome, nutritious, and palatable in an efficient and economical fashion. Age-old practices such as fermentation, as an ancient nonthermal food processing method, have been utilized in rural areas of Iran to provide self-stable food products using plant and/or animal originated raw materials such as milk and cereals. Nowadays, traditional fermented Iranian foods are widely found nationally and regionally, whereas the ethnic Persian fermented dairy products have been produced at a household scale since the earliest civilizations in the Middle East from 10,000 BCE, probably when livestock domesticated and pre-Aryans invented food fermentation.

Distinctive factors such as the method of production, tradition, culture, and region are the main causes of diversity of about 500 fermented dairy products, globally. Two notable groups of fermented dairy products are ethnic and nontraditional products. For ages, Iranians used fermentation as a practical and inexpensive method of food preservation with or without heating. Among different mammal species, ovine, caprine, dromedary, bovine, buffalo, and even mare milk have been utilized to produce Persian ethnic dairy products, but their preparation procedures have remained as crude arts. The methods of preparation of these kinds of food have been passed down by word of mouth and regrettably, there is no documented reference for Iranian fermented foods.

For a long time, organoleptic attributes such as appearance, aroma, taste, texture, and flavor have played as the main crucial, basic qualitative attributes of Iranian

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fermented foods, while currently new scientific evidence revealed a wide range of hidden healthy features resulting in the consideration of traditional methods of food fermentation far above sensory or preservation goals. The increase of Iranian consumer awareness in terms of potential health-promoting effects of traditional foods led to the expansion of the ethnic functional food market in the country. These driving parameters encouraged Iranian researchers to conduct scientific investigations on these types of foods, leading to newly published articles on practices, composition, nutritional and physicochemical properties, and their potential health-promoting effects. The most interesting documented articles are related to the fermentation of dairy foods. For instance, Iranian researchers have reported antipathogenic activities, cholesterol assimilation features of lactic acid bacteria (LAB), as well as physicochemical, rheological, and sensory properties of traditional sour buttermilk, Kashk, Kashk-e Zard, Tarkhineh, and ethnic Persian cheeses such as Pot, Siamazgi, and Lighvan.

In sour Doogh or sour buttermilk, occluded and nonstarter LAB mostly the genera of *Lactobacillus* and *Pediococcus* and probably yeasts play a very critical role in terms of the shelf life elongation, creation of specific sensory attributes, and making it as a functional food. These microorganisms typically convert lactose in milk to organic acids mainly lactic acid in sour Doogh and increase the titratable acidity to 130–180 Dornic degrees and lower the pH to ranges from 3.4 to 3.9. They are also very important in other types of fermented milks such as Mast (yogurt), cheeses as well as a fermented mixture of milk–cereal products such as Kashk, Kashk-e Zard, and Tarkhineh.

Kashk and other types of milk–cereal-based fermented products have been produced traditionally in Iran to provide securely nutritious sources of protein and nutritive minerals when seasonally the availability of fresh milk products is limited. Kashk is a more dairy-based product rather than Kashk-e Zard and Tarkhined that might contain more cereals than milk. Generally, they are produced as follows:

1. Fermented full-fat ovine or ovine/caprine milk yogurt is converted to butter and sour buttermilk in a special device called Mashk.
2. Sour Doogh is boiled to concentrate and reach specific consistency and in some cases mixed with bulgar or cereal flour.
3. Semisolid fermented products are sun dried.

These nutritionally well-balanced dried fermented milk–cereal-based products are stored in ambient temperature for about 4 years.

Although, currently, more than 85% of total milk production of Iran is bovine milk, nonbovine milk mainly sheep milk has been used for producing some Iranian cheeses, while fermentation without heating and brining have been applied as two main crucial steps of cheese making from about 8000–9000 years ago. The most important types of fresh or ripened cheeses have been produced in areas around Zagros and Alborz mountain ranges. The ripening of Iranian cheeses mostly takes

place in brine (e.g., Lighvan cheese), sheepskin (e.g., Siamazgi cheese), and pot (e.g., Koozeh or Pot cheese).

In the subsequent chapter, the most studied traditional fermented dairy products of Iran will be described and their tradition, practices, physicochemical and nutritional properties, as well as their health benefits will be highlighted.