Cheeses of Turkey: 2. Varieties ripened under brine

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Abstract – Although a large number of traditional brined cheese varieties are produced in Turkey, very few are manufactured on an industrial level. The most popular brined cheese in Turkey is Beyaz peynir; other varieties produced at substantial levels include Otlu, Mihalic, Urfa, Malatya, Gaziantep, Hellim, Orgu, Ezine and Dil. Local production of these cheeses has increased significantly and some of them can be found readily throughout Turkey. The volume of milk used in the manufacture of traditional cheese varieties in Turkey is fairly high. Therefore, there is a need to fully understand the microbiological, chemical and biochemical changes that occur in traditional cheeses during processing and/or ripening, so that industrialisation of these products would be possible. This review describes the manufacturing practices, and microbiological and biochemical/chemical properties of traditional Turkish brined cheeses. The description of Beyaz peynir is updated, but other brined varieties are discussed initially.

cheeses of Turkey / brine / white cheese / proteolysis / microbiology / ripening

Résumé – Fromages de Turquie : 2. Variétés affinées en saumure. Bien qu’un grand nombre de variétés traditionnelles de fromages affinés soient produits en Turquie, très peu d’entre elles le sont au niveau industriel. Le fromage affiné en saumure le plus populaire en Turquie est le Beyaz peynir; d’autres variétés produites à des niveaux substantiels incluent les fromages Otlu, Mihalic, Urfa, Malatya, Gaziantep, Hellim, Orgu, Ezine et Dil. La production locale de ces fromages a augmenté significativement et certains d’entre eux peuvent être trouvés facilement partout en Turquie. Le volume de lait utilisé dans la fabrication des variétés de fromage traditionnelles en Turquie est assez élevé.

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Il y a donc besoin de bien comprendre les changements microbiologiques, chimiques et biochimiques qui interviennent dans les fromages traditionnels au cours de la fabrication et/ou de l'affinage de façon à rendre possible l’industrialisation de ces produits. Cette revue décrit les pratiques technologiques et les propriétés microbiologiques et biochimiques/chimiques des fromages turcs traditionnels saumurés. La description du Beyaz peynir est actualisée, mais d’autres variétés saumurées sont présentées pour la première fois.

fromage de Turquie / saumure / pâte fraîche / protéolyse / microbiologie / affinage

1. INTRODUCTION

Brined cheeses are manufactured mainly in Mediterranean and Balkan countries, including Turkey. They are produced under different names, i.e., Beyaz peynir (Turkey), Feta (Greece), Bjalo Salamunre Sirene (Bulgaria), Domiati (Egypt), Teleme (Greece, Romania, Turkey), Iranian White (Iran) and Beli Sir U Kriskama (former Yugoslavia) [33]. Some local varieties ripened under brine are also produced in the above-mentioned countries. Some examples in Turkey are Urfa, Gaziantep, Malatya, Orgu, Mihalic, Ezine, Dil, Otlu and Hellim (Fig. 1); Sfela, Batzos, Kalathaki Limnou in Greece [9]; Gibna beyda in Sudan, Mish in Egypt, Nabulsi in Jordan, Mudaffara in Sudan and Middle Eastern countries, Akawi in Lebanon and Syria [2]. In general, these cheeses have no rind and a salty and slightly acidic taste which arise from storage in a dense brine (12 to 18% NaCl) and the action of lactic acid bacteria during ripening, respectively. Therefore, salt and acid are the critical parameters for conservation of these types of cheese and are checked periodically during maturation to ensure the quality of the cheese.

The cheeses were produced originally from sheep’s or goats’ milk, but recently, cows’ milk or mixtures of these types of milk are used. Since the lactation period of sheep or goats is shorter than that of cows, the use of cows’ milk has increased gradually. However, some types of brined cheeses are produced in Turkey from sheep’s milk only. Ezine cheese is produced from milk of the Sakiz breed in Ezine county of Canakkale, which has obtained a designation “Controlled Geographical Origin”. Also, Urfa cheese is made traditionally from Awassi sheep’s milk in the Sanliurfa region.

2. BEYAZ PEYNIR (TURKISH WHITE BRINED CHEESE)

2.1. Chemical and technological aspects

Beyaz peynir is the most popular cheese variety in Turkey, representing about 60% of the country’s total cheese production; its manufacture dates back thousands of years [72]. The classical product is generally cubical or rectangular in shape with no rind [33]. Although no specific definition of Beyaz peynir is available in the Turkish Standards (TS) based on its moisture content, some researchers have defined the product as semi-hard [73, 74] or semi-soft [19]. According to the present Turkish Standards, Beyaz peynir is divided into four groups based on the % fat-in-dry matter (FDM):

- full-fat (minimum 45 g·100 g⁻¹ FDM);
- semi-fat (30–44 g·100 g⁻¹ FDM);
- low-fat (20–29 g·100 g⁻¹ FDM); and
- non-fat (< 20 g·100 g⁻¹ FDM).

The production technology and chemical, microbiological and biochemical properties of Beyaz peynir were reviewed by Hayaloglu et al. [33]. The manufacturing protocol for Beyaz peynir shows similarities to Feta cheese-making, with slight differences. Cows’, sheep’s, goats’ milk or