Fleur de sel

Subjects: Others

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As mechanized processes developed, small producers of traditional sea salt ceased to be competitive. However, when the valuable salt flower (a.k.a. *fleur de sel*, flower of salt) market appeared, it gave new breath to the activity of traditional salt pan production. Salt flower sensitivity and delicateness became a part of modern food habits. Its crystals present some grain differentiation and these can fulfill diversified consumer tastes. In cooking art, a regular fine flower of salt can be used to finish dishes, whereas a longer and thin grain known as 'scale' (a.k.a. *écaille* de *fleur de sel* in French) can be used for a more gourmet-like palate.

Keywords: coarse salt ; cooking art ; flower of salt

1. Introduction

Coarse salt for human consumption has been produced since ancient times. [1]. The Romans used it not only as an indispensable ingredient in the daily life foodstuff, but also as a payment commodity [2]. In history, throughout times, there are countless examples where the control of scarce resources led to wars. The commodity "salt" is a particular example and can be found namely in the history of Brazil, where, in the 17th century, the Portuguese had to pay the Dutch in salt in order to have peace [3]. Before electricity, salt was quite widespread for preserving foodstuffs and, particularly in the Portuguese culture, salt has been related to dried and salted cod since the time of discoveries [4].

The coarse salt in the food industry has been used not only to preserve food, but also for seasoning before cooking raw meat, vegetables, or fish [5][6]. In the last century, salt alone or in conjunction with other ingredients became quite widespread, not only in the household, but also in the hotel and hospitality business sector [7]. By its turn, grinded salt has been traded as table salt and been commonly bought by households worldwide. Due to the reason of being named as table salt, it can be usually found at the tables of hotel and hospitality services [8]. Many other salt alternatives have been put at the table of the customer, such as sesame salt, composing the foodstuff known as "*gomasio*" [9]. This foodstuff has been used as a healthier alternative to salt alone. Other salty alternatives can be found worldwide, often related to the availability of inorganic materials. Some examples of the former are brine, which is a saltwater solution commonly used to preserve food; halite, which is the chemical designation for rock salt; Himalayan salt, which presents a pink color; and several other mineral components with salty properties [10].

In the past, the upper thin layer that appears on the salt pan, known as flower of salt, was either scratched away or given to salt workers because it was believed that its appearance caused a delay in the formation of coarse salt. More recently, during the 1970s, France began the process of using the flower of salt (*fleur de sel*), and soon after this commodity became much more valuable than coarse salt, due to its higher palatable flavor, and became an innovation in cooking art, being adopted worldwide by several renowned chefs [11]. In the next decades, other European Mediterranean countries followed, starting their flower of salt production. In Portugal, the resurgence of former traditional salt pans occurred by the early 1990s [12], and flower of salt started to be harvested in salterns where coarse sea salt was produced previously [13].

It is believed that flower of salt use is not only more sophisticated when compared to grinded salt (or table salt), but also healthier due to its enriched natural composition. However, there is some contention on this aspect of flower of salt being a healthy alternative, as there is universal recognition that excess sodium is associated with numerous diseases [14]. Thus, its advantageous properties are still not well known, because it is relatively recently accepted in the daily life use [15]. The flower of salt has inspired several dishes and, in some countries, has even been used to name hotels and restaurants.

2. Human Daily Intake of Salt

Salt solutions are essential in the functioning of the human body [16]. Oppositely, salt in excess or taken wrongly can lead to deterioration of health [17], namely by hypertension and blood pressure problems [18] and cardiovascular diseases [19], among others [20]. Due to health problems signaled in the past, new laws have been put in place. In 2003, a joint report issued by WHO and the UN Food and Agriculture Organization (FAO) recommended the need for a reduction in human salt intake to less than 5 g/day [21]. Still, salt intakes vary worldwide according to different cultures, beliefs, and needs [22]. For instance, in Portugal, new legislation came out recently regulating products in the vending machines in several National Health Service (*Sistema Nacional de Saúde*–SNS) institutions that should present a lower dose of salt [23]. As a result, human daily intake should not exceed a certain amount [24]. For example, in the UK, in 2003 the Food Standards Agency followed the Scientific Advisory Committee on Nutrition in recommending a target of 6 g/day by 2010; Ireland also recommended 6 g/day by 2010, Finland 5 g/day, and France, according to Public Health Law (2004), recommended < 8g/day by 2010 [22].

Notwithstanding, trace elements and halotherapy can be used to treat certain human diseases [25]. Iodized salt is also necessary and present in human nutrition [26].

3. Traditional and Innovative Sources of Salt

Due to some physiological processes, humans need some sodium, and this element can be extracted from salt [27]. For human consumption, there are many sources where salt can be found. Mine salt is buried deep into the ground and sea salt evaporates at the edge between air and water in coastal zones [28][29]. The latter can also be produced in several ways. Until the late 1960s, its production was carried out by handcraft means. Due to the reason that salt is traded in the markets as a relatively cheap commodity [30] and for the sake of efficiency, machinery became quite widespread at the benefit of higher production, but at the cost of lesser quality and higher negative impact to the environment [31].

More recently (i.e., since late 1970s in France and early 1990s in Portugal), due to the new market niche for flower of salt, producers felt the need to produce a more environmentally friendly way of traditional harvest [17]. In the traditional production, both coarse sea salt and flower of salt do not contain any added iodine or any anti-caking agents. Notwithstanding, coarse sea salt hardens like a rock and needs to be broken, whereas flower of salt does not agglomerate. There are some extensions of the French flower of salt concept (e.g., sea salt flakes produced in the river Blackwater, UK) [32].

Alongside the gastronomic–cultural issue of salt consumption, particularly in human food, is the tourist demand for production sites. Tourists have shown interest in knowing how coarse salt and flower of salt are produced in a traditional fashion [33].

4. Flower of Salt Identification

Flower of salt's lower density and flotation are the main properties that make the difference when compared to coarse sea salt [34]. Flower of salt can be defined as a thin layer that forms on the surface of each salt pan, due to the continuous evaporation of almost saturated waters. The flower of salt is harvested as it comes and needs to be dried naturally by being exposed directly to the sun in order to eliminate excess moisture and undesired coloring [35], usually pinkish, yellowish, or grayish hues. In the flower of salt can be found 84 trace elements and micro-nutrients, and it is a natural source of potassium and magnesium [36].

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