

Research Progress on Bone Mud Liver Sauce

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Abstract. Bone mud liver sauce was a sauce which the bone mud and chicken liver was mixed in the appropriate proportion and its formula was optimized so that the sauce was obtained to be used for bread and rice. The sauce had a good taste and unique flavor, the sauce also broke the limitation of traditional sauce which was single nutrition, now it has become a new fashionable compound functional food. This review summarized the development and the future prospects of this sauce, and we hoped to provide a basis for future research and development of this sauce.

Introduction

With the progress of society and the improvement of people's living standards, people pay more and more attention to the diet nutrition and health. This review introduced the bone mud liver sauce, it is a compound nutritional food which was in line with the mass consumer psychology^[1]. The liver is one of the main by-products of the poultry product processing industry. The comprehensive utilization and improvement of its additional value of poultry liver will greatly promote the development of poultry products processing industry in China^[2]. The poultry liver into liver sauce is one of the main ideas of comprehensive utilization of the liver. The raw materials used in traditional liver paste processing are single. Its flavor and nutrition are limited. In this review, the bone mud into the liver sauce can improve the calcium content in liver paste. Bone mud contains calcium, essential phospholipids of human brain, protein phosphorus and so on, which can nourish the skin and add fine blood. There can also prevent aging of chondroitin collagen, something that can promote liver function of methionine, vitamin A, B and other nutrients^[3]. Therefore, the research of product may greatly improve the use of poultry by-products and increase the economic benefits of enterprises.

Nutritional value of bone mud liver sauce

(1) Rich minerals

Bone mud was rich in minerals, the most important is the hydroxyapatite crystal $[Ca_{10}(PO_4)_6(OH)_2]$ and $(CaHPO_4)$ and its surface adsorbed Ca^{2+} , Mg^{2+} , Na^+ , Cl^- , HCO_3^- , F^- and citrate plasma. More importantly, calcium and phosphorus in bone powder were essential trace mineral elements, in the chicken bone paste ratio of calcium and phosphorus was the body absorb calcium and phosphorus ratio. Animal liver contained a large number of Fe ions for the anemia of iron supplementation had a good effect, which can change the status of anemia^[4].

(2) High quality protein

The dry product of bone mud liver sauce contained 12.0% -35.0% protein, which was the highest content of collagen fibers that make up the collagen^[5]. And the amino acid composition of protein in bone powder was analyzed and found that bone meal contains 17 kinds of amino acids, which included 8 kinds of essential amino acids^[6]. Among them, the content of more amino acids was glycine, glutamic acid, alanine and aspartic acid. Comparing with essential amino acids in other foods, the protein in this product was a high quality protein.

(3) Reasonable fatty acid composition

Liver sauce contained a reasonable proportion of fatty acids and the main saturated fatty acids were palmitic acid and stearic acid and unsaturated fatty acids^[7]. The ratio of saturated fatty acids to unsaturated fatty acids was close to 1: 1, which was consistent with the recommended composition of fatty acids in the Nutrition Society. In addition, the bone meal also contained trace amounts of unsaturated fatty acids such as myristic acid (14: 0), cardamomoleic acid (14: 1), palmitoleic acid (16: 1) and linolenic acid (18: 3). These acids could meet the daily needs of the human body^[8-9].

(4) A lot of vitamins

Liver vitamin A content was far more than milk, eggs, meat, fish and other food, with the role of maintaining normal growth and reproductive function, it could protect the eyes, maintain normal vision, prevent dry eyes or fatigue and maintain a healthy skin tone^[10]. The liver contained vitamins and also contained a variety of vitamins, such as: VA, VD, VB1, VB2, VB12 and so on. Regular consumption of animal liver could add VA and B2, It played an important role in the supplement of the important coenzyme and the elimination of some toxic components. The liver also contained vitamin C and trace elements selenium, they could enhance the body's immune response, anti-oxidation, anti-aging and can inhibit the production of tumor cells^[11].

Research status of bone mud liver sauce

The liver sauce was a new nutritional food. Many developed countries attach great importance to the research and development of this new food. In recent years, the food had aroused the attention of China's food industry, although many medias report on this, most of our products were still relatively unfamiliar. The mechanized production of bone mud liver sauce had yet to be further research and exploration^[12]. Especially it was still very weak in the use of bone mud technology so that bone mud liver food rarely put on the market, so this emerging food had broad prospects for development^[13]. Bone mud liver sauce food was gradually being recognized, but most people did not understand the fact^[14]. Early 80s, many Chinese scholars began to introduce bone mud liver sauce processing, utilization, nutrients nutrition and on the impact of human health. At the end of the eighties, many newspapers and magazines often aspect the bone mud liver sauce, making the food began to cause the attention of the food industry. We began to introduce foreign bone mud liver sauce with utilization, at the same time, foreign food machinery manufacturers have begun to sell bone mud processing and liver sauce machinery in China. Edible fresh bones mud from the fineness and taste could be directly consumed, but because of calcium, phosphorus and other mineral content were too high, direct eating was not conducive to human digestion and absorption, the most appropriate way was to use it as additives with other food with the processing of edible^[15]. Therefore, the use of bone mud as a food additive to the liver sauce made of a compound functional food to eat was an effective method to solve the problem. The country had not yet found a liver sauce food occupy a certain market, so food companies should seize the gaps in the field, the opportunity and decisive shot and the product will have a broad market prospects^[16].

Bone mud liver sauce development direction

First of all, bone mud liver sauce was rich in minerals, protein, unsaturated fatty acids, and vitamins, therefore had a wealth of nutritional value. But the problem could not be ignored was that the chicken will make high cholesterol, liver disease, hypertension and coronary heart disease exacerbations. So future researchers should try to reduce the cholesterol content of chicken liver, so that consumers could rest assured that the consumption of such products^[17]. Secondly, the bones and liver parts of the birds were the most abundant parts of heavy metals. Therefore, it was an important problem that how to measure the heavy metal content and how to remove it^[18]. Finally, because our country's diet was mainly grain, these plant foods phytic acid and oxalic acid could be combined with dietary calcium minerals into insoluble salts, directly hinder their absorption which made our population generally lack of calcium. Because the bone mud was rich in calcium, which could be bone liver sauce as a functional products role with calcium role^[19].

Conclusions

This review concluded the current situation of the development of the nutritional value of bone, liver paste, as well as the future development direction for the future. Because the liver paste cost of raw material was low and was rich in nutritional value. Therefore, it had a good prospect in poultry industry. As long as these enterprises grasps the key technology of the process, they will bring good economic benefits for these enterprises so as to promote development of the social^[20].

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