

APPLICATION OF FAT SUBSTITUTE IN GELATINOUS CONDITIONING MEAT PRODUCTS

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Gelatinous meat products are fresh and tender. They are convenient to eat, easy to carry, and retain the nutrition and flavour of meat quality, are increasingly popular among consumers.

It has become the trend of meat products development. Traditional gel products belong to high-fat foods, which can lead to health problems.

Therefore, researchers are also trying to find various new technologies to reduce the fat in this kind of meat products; the most commonly used method is to use fat substitutes. At present, the commonly used fat substitute products usually have the following categories: protein-based substitutes; fat based substitutes; carbohydrate based substitutes. Compared with meat products without fat substitutes, most of the fat substitutes can significantly improve the oil and water retention of meat products, and have a greater impact on the product texture.

Protein denaturation can change the texture, gel formation and water retention of products, especially the denaturation of some plant proteins, such as soybean protein, peanut protein, pea protein, wheat protein and so on. Soy protein can promote emulsion formation and improve its stability. Through the binding of fat and water, improve the oil and water retention performance, so as to improve the yield. It can also prevent oil separation and precipitation, promote the viscosity between meat particles, improve the texture characteristics of products, etc. At the same time, it can play an anti-oxidation role to a certain extent and improve the storage performance of the product. Complementation of animal and plant proteins can also increase nutritional value. The production cost can be reduced by adding plant protein to the meat products. But adding too much will produce obvious beany smell. Soybean flour (50% protein), soybean protein concentrate (70% protein) and soybean protein isolate (90% protein) are commonly used in the production of meat products.

The protein content of whey protein commonly used in the production of meat products is generally between 34% and 80%. By mixing milk protein with other additives and adding them into meat products by injection, the product has a good improvement effect.

Hydrolyzed whey tissue protein and corn starch were mixed into chicken cake in the ratio of 2:1, which significantly reduced cooking loss and cooking shrinkage, but the cohesiveness was lower than that of whole meat cake. However, the application of whey protein concentrate in low-fat meat products will increase the cost. Therefore, as a fat substitute, its water retention is usually offset by its increased cost. Whey protein application in low-fat meat products can save 10%-20% of the cost.

Collagen has good water binding ability and protein binding ability, so it is usually used as a good fat substitute in production. The texture and sensory quality of 2% collagen mixed with 8% water added to the low-fat beef cake were significantly better than that of the product containing 18% fat. In addition, collagen has strong water retention property, reduces cohesion, reduces fat oxidation, improves brightness value, and has no adverse effect on cooking loss, but the flavour is decreased.

There are two forms of fat based substitutes: single fat simulant, including vegetable oil and emulsifier (such as soybean lecithin, fatty acid monoglyceride, sucrose ester, sorbitol, propylene glycol fatty acid ester, etc.). The second is the compound fat simulant, which means that the single substitute is mixed according to the appropriate proportion, and the fat is replaced as much as possible in the meat products on the premise of ensuring the quality. When rapeseed oil and other protein (soy protein isolate, sodium caseinate, whey protein isolate) were added separately to replace animal fat, the fat content of beef cake was reduced from 25% to 10%, while the yield and hardness value were significantly increased, and the texture quality was improved.

Carbohydrate based substitutes mainly include starch, various colloids, cellulose and other carbohydrate substances.

Adding 2% and 4% enzyme modified potato starch to the low-fat beef emulsion to replace the fat in the product (the fat content is 5%, 10% and 20%, respectively). Compared with the control group (the fat content is 30%), the energy value of the added group decreased by 15% to 49%.

Adding sodium alginate to chicken cake can make the product have high hardness and brittleness, compact and uniform structure, reduce cooking loss and weight loss of secondary heating, but the juiciness is slightly poor, and has no effect on the flavour of the product.

In recent years, the development speed of fat substitutes in food has broad application prospects. Therefore, it is the future research direction to explore new safe, nutritious and efficient compound fat substitutes and improve food texture and flavour.