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Effect of Antioxidant Treatment on the Quality of Traditional Air-dried Beef

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Abstract: Antioxidant treatment is not entirely without negative effects, as some antioxidants may have certain effects on human health, especially at high doses. At present, there are a series of problems in the use of antioxidants in air-dried beef, such as chemical synthetic antioxidants and natural antioxidants. Therefore, this paper mainly analyzes the effect of antioxidant treatment on the quality of traditional air-dried beef, and puts forward some personal views for reference.

Keywords: Air-dried meat; Quality; Antioxidant treatment

1. Effect of antioxidant treatment on the quality of traditional air-dried beef

1.1 Favorable Effects

(1) Extend shelf life: antioxidants can delay the oxidation process of beef, thereby extending the shelf life of the product. This is very important for the storage and sale of air-dried meat products, especially if no chemical preservatives are added. Nutritional Value Preservation Proteins are prone to denaturation and degradation under oxidative conditions, which may lead to a reduction in their nutritional value. Antioxidant treatment can slow down or inhibit the oxidation reaction of proteins, which helps to protect the protein in air-dried beef and maintain its good nutritional quality. Some vitamins are sensitive to oxygen and easily lose their activity in an oxidizing environment. Antioxidant treatment helps maintain vitamin stability in air-dried beef and prevents excessive loss during storage and transportation. In particular, antioxidant vitamins such as vitamin E themselves can also protect other nutrients to a certain extent. Lipid oxidation produces free radicals that can cause indirect damage to other nutrients. Antioxidant treatments can slow down the process of lipid oxidation, reduce free radical production, and help protect other nutrients in air-dried beef. Proper antioxidant treatment ensures that the quality of air-dried beef is maintained throughout the supply chain, avoiding nutrient loss due to oxidation during storage and transportation. This is very important to ensure that consumers can get the full nutritional value when eating air-dried beef.

(2) Maintain color: In the food industry, color is a very important factor when consumers choose and purchase products. For meat products such as air-dried beef, maintaining good color not only affects the curb appeal of the product, but is also directly related to consumer expectations for taste and quality. The oxidation process may result in pigmentation changes on the surface of air-dried beef and a darker color. This change not only affects visual appeal, but can also be misinterpreted by consumers as a decline in product quality. Through antioxidant treatment, the oxidation process can be effectively slowed down or prevented, thus maintaining the good color of air-dried beef. Bright, attractive colors can often attract the attention of consumers, making them more willing to choose to buy this product. Oxidation may cause beef to darken in color and lose its appeal. Antioxidants help maintain the natural color of beef, making it more attractive on the outside.

(3) Improve flavor: By slowing fat oxidation, antioxidants help maintain the fresh flavor of meat products, ensuring that consumers get better taste and flavor when they taste. Oxidation of fats and proteins can cause the loss of moisture inside the air-dried beef, making it dry. Antioxidants slow the loss of water, helping to maintain the wetness and taste of air-dried beef. Oxidation of fats and proteins can change the texture of air-dried beef, making it sticky or too dry. The antioxidant treatment helps to slow down this texture change, allowing the air-dried beef to maintain a more desirable taste. Oxidation of fat and protein can affect taste, making dried beef hard or unpleasant to taste. Antioxidant treatment can maintain the tender and smooth taste of air-dried beef to a certain extent and improve its comfort in the mouth.

(4) Prevent fat oxidation: antioxidants can prevent the oxidation process of fat in beef. Fat oxidation may lead to deterioration of meat quality, resulting in odor and poor taste. The use of antioxidants helps maintain the freshness and taste of beef. Fat oxidation may lead to unpleasant odors, which may affect the flavor quality of air-dried beef. Antioxidant treatment can prevent or slow down fat oxidation to a certain extent, thus helping to maintain the original flavor of air-dried beef. Fat oxidation often causes the fats in the food to deteriorate, producing

volatile compounds and odors that can cause dried beef to lose its characteristic flavor properties. Antioxidant treatments can help prevent the formation of undesirable odors by slowing down oxidation reactions and reducing the production of fat oxidation products. Choosing the right antioxidants and treatment methods is crucial to maintaining the original flavor of air-dried beef. Some commonly used antioxidants, such as vitamin E, vitamin C, polyphenols, etc., can effectively inhibit fat oxidation and protect the flavor quality of air-dried beef. In addition, herbal spices, vanilla extracts, etc. can also be used for antioxidant treatment, while giving more flavor to air-dried beef and enhancing the overall flavor experience. Therefore, antioxidant treatment can not only maintain the taste of air-dried beef, but also help to maintain its original flavor and provide a better eating experience. For food, this is one of the key factors to ensure that the product is popular in the market.

1.2 Adverse Impact

(1) Possible effect on flavor: In some cases, the use of antioxidants may have a slight effect on the flavor of meat products. Although the main role of antioxidants is to prevent oxidation, the amount and type of certain antioxidants added may have a slight effect on flavor.

(2) Excessive use may cause problems: If the amount of antioxidants used exceeds the recommended level, it may cause product quality problems. Too many antioxidants can negatively affect the appearance, texture, and flavor of meat products.

(3) Possible allergic reactions: Some people may have allergic reactions to specific antioxidants. Therefore, when adding antioxidants, it is necessary to pay attention to the ingredient information in the product label to ensure that the product meets the health needs of consumers.

2. Traditional air-dried beef antioxidant treatment method

At first, the food industry widely used chemically synthesized antioxidants in products such as air-dried beef, including some common preservatives and antioxidants such as sulfites, nitrates, BHA (butylhydroxyphenol), BHT (butylhydroxytoluene), and others. These chemically synthesized antioxidants are used to extend the shelf life of products and improve color and taste, but over time, concerns have been raised about their possible health and environmental risks. There has long been concern about the link between excessive intake of some chemically synthesized antioxidants and health problems. Some antioxidants are suspected to be linked to allergies, cancer and other problems. The preparation and use of some chemically synthesized antioxidants may have adverse effects on the environment, including pollutants produced during production and handling. As awareness of the downsides of chemically synthesized antioxidants has grown, the food industry has increasingly sought more natural, healthy alternatives. Natural antioxidants, such as vitamin C, vitamin E, polyphenols (such as tea polyphenols, anthocyanins, etc.), began to be widely used in foods such as air-dried beef. These natural antioxidants not only have antioxidant properties, but are also generally considered to have a positive effect on human health. The modern food industry often uses a mix of multiple antioxidants to increase effectiveness and reduce the amount of each. Further research and technological innovation are also driving the development of new natural antioxidants to meet the ever-increasing requirements for product quality and health and safety. The antioxidant treatment of traditional air-dried beef is mainly through the addition of natural antioxidants to delay the oxidation process of fat and protein. Here are some possible antioxidant treatments for traditional air-dried beef:

2.1 Vitamin E (alpha-tocopherol)

Vitamin E is a powerful antioxidant that can effectively delay fat oxidation. During the production of air-dried beef, its antioxidant capacity can be increased by adding foods or raw materials rich in vitamin E, such as nuts, seeds, vegetable oils, etc.

2.2 Vitamin C (ascorbic acid)

Vitamin C is a water-soluble antioxidant that slows the oxidation of fats and proteins. Certain fruits and vegetables, such as citrus, strawberries, tomatoes, etc., are rich in vitamin C and can be treated with antioxidants by adding these ingredients or extracting their extracts.

2.3 Addition of gravy or bone broth

Adding fresh gravy or bone broth can provide natural antioxidants to air-dried beef. The natural antioxidants in these soups can help slow down the oxidation process while also adding flavor.

2.4 Herbs and Spices

Some herbs with antioxidant properties, such as rosemary, thyme, etc., can be added to the curing liquid of air-dried beef to provide an antioxidant effect.

2.5 Antioxidant herbal sauce

Make a special herbal sauce that contains ingredients with antioxidant properties, such as garlic, ginger, Onions, etc., and then use this sauce to marinate air-dried beef.

2.6 Honey and maple syrup

The antioxidants found in honey and maple syrup can be used as part of an antioxidant treatment. Not only do they provide sweetness,

they also help maintain the color and texture of the air-dried beef.

3. Closing remarks

When using these antioxidant treatments, care needs to be taken to ensure the freshness and hygiene of the ingredients to prevent the growth of undesirable microorganisms. In addition, the amount of additives used needs to be carefully controlled to ensure that oxidation is delayed without affecting the traditional flavor of air-dried beef.

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