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Chapter 14

Dietary Administration of Animal Diets with Aromatic and Medicinal Plants: Influence on Meat Quality

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Abstract

Aromatic plants are gaining importance in recent years as potential sources of natural food preservatives due to the growing interest in the development of safe and effective natural food preservation. The use of vegetal substances with antimicrobial and antioxidant properties to increase the shelf life in meat and meat products is a promising technology. Taking into account that the diet with antioxidant may be absorbed and prevent lipid oxidation and colour deterioration, the possibility of feeding animal diets contains aromatic and medicinal plant (as thyme leaf, rosemary and sage) as natural antioxidants and antimicrobials represent a very interesting opportunity to replace synthetic antioxidants. In this sense, herbs of the Labiatae family, such as rosemary and sage, have been extensively studied for antioxidant and antimicrobial activities in a variety of systems. This review gives an overview of the current knowledge and recent trends in the use of plant-derived compounds from aromatic and medicinal as antimicrobials and antioxidant in animal diet and its effect on meat quality, their potentials and challenges.

Keywords: aromatic plants, meat, animal diet, antioxidant, antimicrobial, meat quality

1. Introduction

Animal scientists have been interested in improving meat quality and product composition through the modification of the diet of animals. The possible use of nutritional strategies to improve quality of food products from livestock is a new approach that emerges at the interface of food science and animal science. These strategies have emphasized in the improvement of the oxidative stability, such as supplementation of animal with natural antioxidants to minimize pigment and lipid oxidation in meat or the alteration of nutritional profile, increasing the content of polyunsaturated fatty acid (PUFA). The consumption of meat (rich in saturated fatty acid)
is related with diseases such as some types of cancers and cardiovascular diseases (especially in developed countries).

In this sense, in recent years, consumers’ pressure to reduce the composition and quality of fat in meat has led to attempts to modify meat by dietary strategies [1]. The modification of fatty acid profile of meat is to decrease saturated fatty acid and increase the ratio n-3: n-6 and PUFA: SFA (>4).

Between the strategies used, meat can be modified by external addition in the elaboration of meat or by the addition in the animal diet of ingredients considered beneficial for health, where these ingredients are able to eliminate or reduce components that are considered harmful. In this sense, several studies have shown that animal diet can strongly influence the quality of the meat.

For example, the stability of muscle foods further improves after the addition of food ingredients in diet of animals than the direct addition to the meat products, because the antioxidants are deposited where it is most needed. In order to alter the oxidative stability of intact muscle foods, the only technology available is the use of food ingredients in the diet. In these products, where natural antioxidants are added to the diet producing a nutritional alteration of muscle composition, no additive declarations are required and are more label-friendly.

Taking into account all these considerations, recent changes in legislation controlling the use of animal feed additives and the increasing demand of consumers for healthier meat products, if possible free of chemical additives, have stimulated interest in bioactive secondary metabolites as alternative performance enhancers.

2. Production of functional meat products

2.1. Functional meat products

Meat and meat products are essential for a balanced diet, although it must also be remembered that they are susceptible to modifications to give them a ‘healthier’ appearance. Numerous studies have demonstrated the possibility of changing the image of meat and meat products from the traditionally accepted image to one of healthy living thanks to the modification of animal diet, addition (vegetables, extracts, fibres, herbs, spices, etc.), elimination (fats) and reduction (saturated fatty acid, additives) of different ingredients. The object of including functional ingredients in the case of meat is not only concerned with providing it with certain desirable properties but also an attempt to change its image in these health-conscious days.

However, meat has beneficial health effects, for example, regarding obesity, and it also has satiating properties. This aspect is very important in the development of tasty and satiating functional meat products.

Therefore, in meat, the modifications to which it may be subjected to confer functional properties on it are based on modifications to the feed an animal receives or on postmortem manipulation
Active Ingredients from Aromatic and Medicinal Plants
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