Title

Analysis of volatile organic compounds (VOCs) in dog food using gas chromatography-mass spectrometry (GC-MS) and the correlation with dog appetite

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The well-being of pet dogs is a top priority for their owners, and food plays a crucial role in ensuring their contentment. In the pet food industry, the primary goal is to develop appealing food products for dogs, with factors such as appearance, taste, smell, and texture all playing significant roles. Among these, the scent of the food is particularly important and can influence a dog's eating habits. To enhance the appeal of dog food and preserve its aroma during storage, manufacturers often incorporate palatability enhancers.

The objective of this study was to characterize the volatile organic compounds (VOCs) in commercial dog pellet food products that may influence canine appetite, using headspace-solid phase microextraction coupled with gas chromatography-mass spectrometry (HS-SPME/GC-MS). The VOCs in dog food were primarily composed of aldehydes, particularly hexanal. Additionally, 2-pentylfuran and 2,6-dimethylpyrazine were identified in both dried chicken and dog pellet food. These compounds are likely products of the oxidation of unsaturated fatty acids or the Maillard reaction during processing, especially with protein sources like chicken meal. Furthermore, dog pellet food contained butylated hydroxytoluene (BHT), an antioxidant additive that helps inhibit these oxidative reactions.

Therefore, compounds such as hexanal, heptanal, octanal, 2-pentylfuran, and 2,6-dimethylpyrazine could serve as potential markers for identifying chicken ingredients in dog food and may be linked to sensory properties that influence palatability.

In conclusion, this research explores various aspects of sustainability in relation to animal-derived products, including animal welfare, production efficiency, and technological innovations that affect health and nutritional factors.

Keywords

Animal nutrition; dog appetite; volatile organic compounds (VOCs); HS-SPME/GC-MS