

Describing the smell of wet cat food using a common sensory language: Petscript®

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Abstract

Meal time is increasingly considered by pet owners as a privileged moment to create emotional bonds with their animal. To make meal time a shared enjoyable moment, pet food manufacturers not only need to satisfy pets' appetite, they also need to satisfy pet owner expectations towards food. For instance, pet food cosmetic and sensory properties such as appearance and smell highly contribute to its acceptance by the pet owner. These factors play an important role in the act of repurchase of the pet food product. Only a few research studies have used human sensory analysis to describe the smell of wet pet food. The purpose of this study was to characterize the smell of different wet cat foods available on the European market using Petscript®, a sensory language specifically developed for this type of product. First, a full set of olfactory descriptors was generated by a human expert panel in order to have a common sensory language to describe the odor profile of wet pet food. Then, several products were selected to offer a representative picture of the market. All these products were assessed via a Rate All That Apply (RATA) method in association with a free description to have an exhaustive odor characterization. The products were then positioned on a map according to their olfactory profile. The Petscript® sensory language was successfully used to build the olfactory space for wet cat food. The results highlight the existence of clusters of products showing similar odor profile. The Petscript® language can be used to support pet fooders' strategy by positioning their products in the olfactory landscape, and helping them to reach a specific smell target and then differentiate from the other products on the market. The ongoing challenge is now to couple these sensory results with human and animal preferences to identify the smell profiles appreciated by both pet owners and their beloved animal.

Introduction

In the past 10 years, human sensory panels have been used to characterize different pet foods [1, 2]. However, there is a lack of a common sensory language to describe the smell of pet food. Furthermore, it has been observed that prior experience and cultural environment can affect the way people describe the smell of food products [3]. The purpose of this study was to utilize a unique and universal sensory language - the Petscript® - to characterize the smell of different wet cat foods available on the European market.

Experimental

Market products: 32 premium and super premium wet cat foods were bought in France, UK and Germany (Figure 1). All the products were chicken based recipes in different matrices: chunks in jelly, chunks in gravy, loaf or mousse. They were packed in pouches, cans or aluminum trays.



Figure 1: 32 European wet cat foods used in the study

Sensory sessions: 25 judges were trained on the Petscript® language. Figure 2 presents the Petscript® olfactory descriptors used to characterize wet pet food. The whole study was divided into 9 sensory sessions. Up to 4 products were presented during each sensory session. 11 to 21 trained judges participated to each sensory session. The products were randomized between judges over each session. The sessions were conducted under red light to avoid any sensory bias.



Figure 2: The 25 odor terms of Petscript® sensory language for wet pet food

RATA method [4] with a 4 points scale was used to describe all the cat food products, using the 25 odor terms of the Petscript® language. The order of the odor terms was randomized between judges, over each sensory session. The judges could also add up to 5 odor terms of their choice to describe the smell of the products.

Data analysis: a mixed model was used with “judge” as a random effect and “product” as a fixed effect for each descriptor (STATGRAPHICS Centurion XVI.I). A PCA was conducted on adjusted means (SPAD8). An AHC (Ward criteria) was then applied to the factorial coordinates of the products in the spaces defined by PCA (SPAD8).

Results and discussion

An olfactory space with 6 distinct clusters was obtained from PCA (Figure 3).

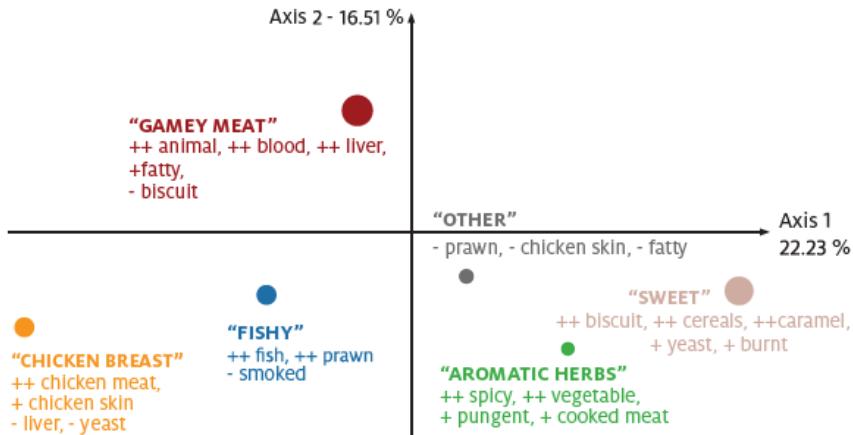


Figure 3: Representation of the 6 clusters of products in the 1st and 2nd dimensions of the PCA

Two clusters are opposed on axis 1, the "CHICKEN BREAST" cluster and the "SWEET" cluster. The "CHICKEN BREAST" cluster gathers together products characterized by 'chicken meat' and 'chicken skin' olfactory notes. These hyper premium products were all bought from the UK market. They contain above 45% of chicken meat in a clear white jelly or gravy. On the other hand, the "SWEET" cluster was described with 'biscuit', 'cereals', 'caramel' and 'grilled' terms that are typical of products from the Maillard reaction. The darker color of these products and the mention of 'sugar' in the ingredient list also point towards the Maillard reaction.

Two clusters are opposed on axis 2: the "GAMEY MEAT" cluster, characterized by 'animal', 'blood', 'liver', and 'fatty' olfactory notes; and the "AROMATIC HERBS" cluster, characterized by 'rosemary', 'thyme' and 'basil' olfactory notes. The "GAMEY MEAT" cluster is the most represented on the EU market and could target animal satisfaction [5]. The cluster "AROMATIC HERBS" contains 3 products bought respectively from UK, France and Germany. The use of herbs ingredients in these recipes underlines the trend of 'humanization', with pet food products not only design to attract pets, but also to improve pet owner satisfaction towards smell.

The 2 last clusters "FISHY" and "OTHER" are better represented in the 3rd, 4th and 5th dimensions. The "FISHY" cluster is characterized by 'fishy' and 'prawn' olfactory notes. The "OTHER" cluster contains products with particular olfactory profiles and weaker smell intensity. One product from this cluster was for instance described as 'peanut like'. Two products out of the 5 products in the "FISHY" cluster declare containing at least one fish ingredient (fish oil or fish extract).

In this study, the Petscript® sensory language was successfully used to build the olfactory space for European wet cat food. Petscript® allowed differentiating selected products based on their odor profiles. Odor similarities and differences between products could be due to recipes and raw material origin, process, and manufacturing place. They can also highlight different pet food manufacturers' strategies. Indeed, one pet food

manufacturer has all his products in the cluster “GAMEY MEAT” while another pet food manufacturer has 3 out of 4 products in the cluster “SWEET”. These could traduce pet food manufacturers’ will to create a brand olfactory signature. On the other hand, other brands use smell differentiation according to product positioning. One famous brand of pet food has their products spread in 4 out of the 6 different olfactory clusters.

Petscript® can be used to support pet fooders’ strategy by positioning their products in the olfactory landscape, and helping them to reach a specific smell target or to differentiate from the other products on the market. The ongoing challenge is now to couple these sensory results with human and animal preferences to identify the smell profiles appreciated by both pet owners and their beloved animal.

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