SCIENTIFIC RELEASE

CATERING TO CATS INDIVIDUAL PREFERENCES

DIANA
Performance from nature
PET FOOD

■ INTRODUCTION

> CAT OWNERS LIKE TO CATER TO THEIR CAT PREFERENCES...

Meal time is a privileged moment during which pet owners always wish to please their animals with tasty products they will enjoy. Cat owners also aspire to offer products best suited to their animal needs and expectations. Accordingly, pet food manufacturers develop a wide range segmentation meeting different age, lifestyle and physiological needs. However, dry cat food offers limited recipe choices and meal variety is restricted to the main flavors: poultry, beef, fish, ... Cat parents might feel they do not have enough choice to buy what they consider to be their animal favorite food.

> ...BUT HOW CAN CATS PREFERENCES BE CHARACTERIZED?

Several studies already demonstrate that cats have individual preferences that are both innate, such as the dislike of bitter taste[1], and acquired. Indeed, antenatal, perinatal and postnatal exposures significantly influence olfactory preferences in kittens from birth till weaning[2]. Feeding history, influenced by behavioral and social elements[2], and resulting from a balance between neophilia[3] and neophobia[4] will make cats taste evolve over time[5].

To further understand cat food palatability drivers, DIANA PET FOOD experts in palatability designed a complete study. It included palatability data from both expert and in-home cat panels to define whether it was possible to identify cat populations showing similar food preferences.

■ 1ST STEP : IDENTIFYING CAT INDIVIDUAL PREFERENCES IN EXPERT PANELS

> DESIGN OF THE STUDY

In order to define whether cat populations with similar preferences exist, a first survey was conducted. It analyzed a database containing the preference data of over 380 cats collected during 3 years at Panelis (DIANA PET FOOD Division expert center in palatability measurement).

This database recorded 4 categories of variables with several modalities:

- ■ Individual cat variables: name, age, weight etc.
- ■ Diet variables: kibble type, fat type, Palatability Enhancer (PE) form, nature or species etc. adding up to a total of 40 diet modalities.
- ■ Exposure variables: total number of exposures per cat for each modality.
- ■ Preference variables: A binary preference variable based on individual food consumption and consumption ratio was defined assigning a score of 1 to the most eaten product and a score of 0 to the other product.

For each modality, several classes of individual cat exposure were defined ([0-10], [11-20], [21-50], [51-100] etc.). To limit neophilia and neophobia effects[5] it was decided to consider the preference of cats that have been exposed at least 10 times to a modality.

The database collecting this information finally contained over 350.000 rows (Figure 1).

IDENTIFICATION VARIABLE			EXPOSURE VARIABLE		PREFERENCE VARIABLE		
CAT NAME	GROUP	...	CLASS OF EXPOSURE	...	AVERAGE CONSUMPTION DIFFERENCE VARIABLE 1	AVERAGE RATIO VARIABLE 1	...
Abricot	GR 7	...	[21-50]	...	21.36	74.25	...
Abscinthe	GR 7	...	[101-200]	...	-5.14	40.15	...
Abysse	GR 5	...	[11-20]	...	3.14	53.17	...
...	...	...	...	...			...

Figure 1: Extract of Diana Pet Food expert panel database used for identification of individual preferences.

The cat individual consumption and preference data were statistically processed using two forms of multivariate data analysis: PCA (principal components analysis) and HCPC (hierarchical clustering on principal components).

> RESULTS

This extensive data processing defined cat populations showing similar food preferences for several studied modalities.

Focus is made here on 2 specific diets modalities "A" and "B", corresponding to 2 different PE aromatic compositions. Data processing for these 2 PE modalities clearly highlighted 4 distinct clusters of cat populations with 4 levels of preferences for A or B (Figure 2, Figure 3):

- ■ "Strong A liker" (SAL) population
  - with an average consumption ratio for A of 73%
  - composed of 15% of the cats of the database

- ■ "Light A liker" (LAL) population
  - with an average consumption ratio for A of 59%
  - composed of 45% of the cats of the database

- ■ "Light B liker" (LBL) population
  - with an average consumption ratio for B of 52%
  - composed of 27% of the cats of the database

- ■ "Strong B liker" (SBL) population
  - with an average consumption ratio for B of 72%
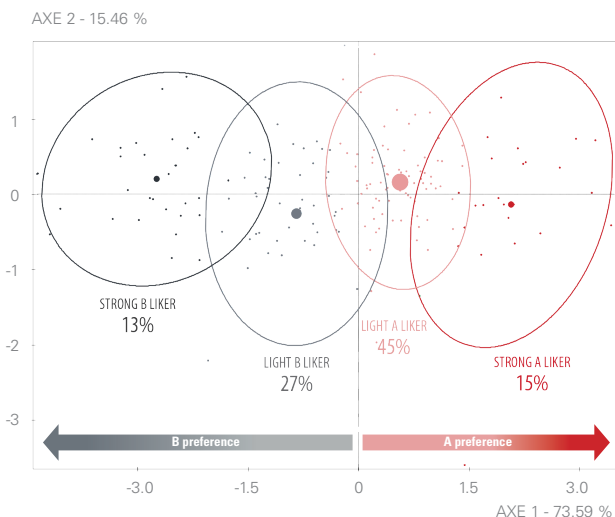 - composed of 13% of the cats of the database

On the other hand, cats belonging to "low liker" categories, even with an average mean in favor of one modality, were more labile in their preference. They were more likely to show regular inversion of their consumption ratios.

Figure 4 illustrates this difference in preferences with 2 cats: Alan, a Strong A Liker (SAL) and Aladin, a Low A Liker (LAL). It clearly shows that Alan prefers modality A with a very few exceptions whereas Aladin changes his mind frequently.

Figure 2: Representation of cat populations obtained by PCA and HCPC on "A" and "B" modalities for the expert panel.

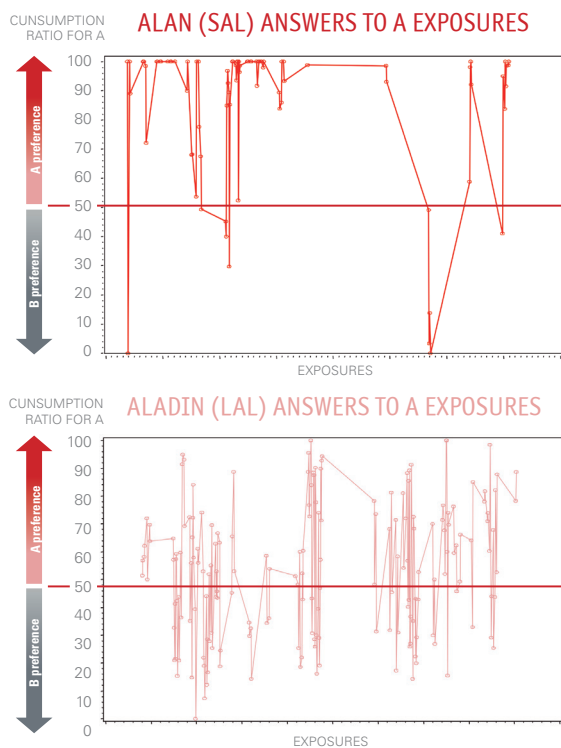Figure 4: Consumption ratio to the overall A exposures of Alan (strong A liker) and Aladin (light A liker).

Figure 3: Repartition of the 4 cat populations obtained for A and B preferences in expert panel

- SAL: Strong A Liker
- LAL: Light A Liker
- LBL: Light B Liker
- SBL: Strong B Liker

Further analysis of cats' individual data established that cats belonging to the "strong liker" categories maintained their strong preference over time with very few changes of their overall preference.

■ 2ND STEP: IDENTIFYING CAT INDIVIDUAL PREFERENCES IN IN-HOME PANEL

> DESIGN OF THE STUDY

A 10 days in-home versus test survey was conducted in order to confirm the existence of cat populations with similar preferences. 100 cat owners[6] tested products having the same "A" and "B" palatability enhancer's modalities than in the expert panel. During the study, 1st product smelled, 1st product eaten and quantity consumed of "A" product and "B" product were monitored for each meal (one meal per day).

> RESULTS

Consumption ratios from the 10 days versus test (statistically processed using PCA and HCPC) separated the 100 cats into 4 distinct cat populations showing the same specific preferences towards "A" and "B" modalities. The clusters were the same than the ones found previously, but the average consumption ratios differed very slightly (Figure 5, figure 6):

- "Strong A liker" (SAL) population
  - with an average consumption ratio for A of 82%
  - composed of 12% of the cats of the in-home test

- "Light A liker" (LAL) population
  - with an average consumption ratio for A of 57%
  - composed of 28% of the cats of the in-home test

- "Light B liker" (LBL) population
  - with an average consumption ratio for B of 59%
  - composed of 32% of the cats of the in-home test

- "Strong B liker" (SBL) population
  - with an average consumption ratio for B of 82%
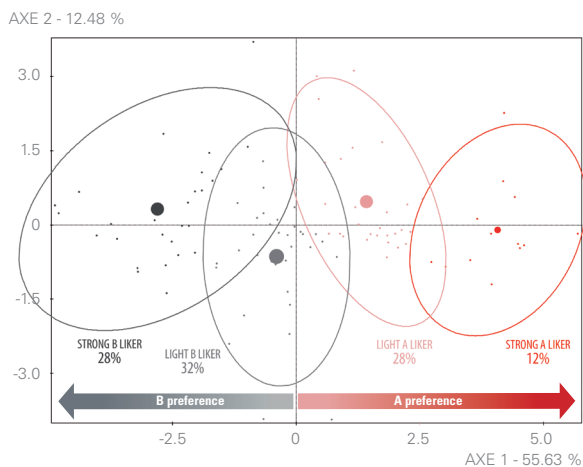 - composed of 28% of the cats of the in-home test

Figure 5: Representation of 4 cat populations obtained by PCA and HCPC on "A" and "B" modalities for the in-home panel.
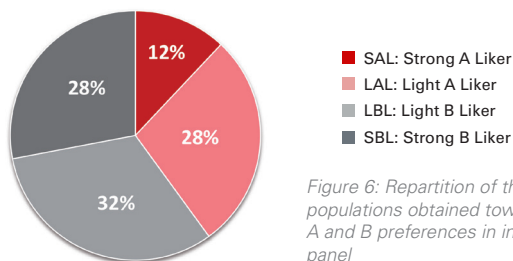

- SAL: Strong A Liker
- LAL: Light A Liker
- LBL: Light B Liker
- SBL: Strong B Liker

Figure 6: Repartition of the 4 cat populations obtained towards A and B preferences in in-home panel

CONCLUSIONS

With this study, not only did Diana Pet Food confirm the existence of cat populations showing similar food preferences, but also established that Panelis cat experts are representative of what cat consumers perceive in home-like conditions.

Thanks to Diana Pet Food unique preference database, cat individual preference profiles can be mapped on numerous modalities as represented on Figure 7.
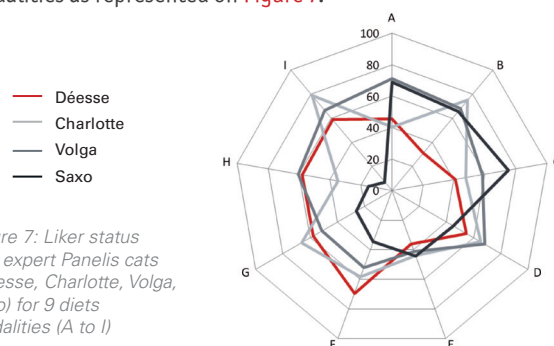

- Déesse
- Charlotte
- Volga
- Saxo

Figure 7: Liker status of 4 expert Panelis cats (Déesse, Charlotte, Volga, Saxo) for 9 diets modalities (A to I)

This research opens new paths for range segmentation, cat performance and pet owner satisfaction. Indeed, diets available on the market today are developed to please a majority of cats. The studies and results presented clearly suggest that segmenting products according to cat food preferences could be an opportunity to better satisfy cat population while meeting cat owners' expectations in terms of recipe's diversity. Offering the most adapted palatability enhancer solutions is the main lever to reach this target.

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4 - Thorne, C.J. (1982). Feeding Behaviour in the cat - recent advances. Journal of Small Animal Practice, 23, 555-562.

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6 - SPF in-home cat owner consumer test cat owner, 100 consumers, France 2012. Conducted with Technisens.

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