

Activity 1.3 Analysis of consumer needs and demands and identification of their role in influencing agrifood companies to undertake a transition to greener packaging.

Delivery: Preliminary analysis of research results on consumer requirements for food packaging

Surveys were conducted using the CAWI (Computer-Assisted Web Interview) method (on the Qualtrics platform) on a panel of respondents from countries such as Poland, northern Italy, the Czech Republic, Hungary (Norstat panel), and Slovenia (own panel) in the period January - February 2025. A total of 1,181 people took part in the research. The group was selected in a quota manner and represented by the surveyed communities based on place of residence, number of inhabitants, gender, and age. In the survey questionnaire, there were 7-point scale questions used, as well as questions about demographic and social characteristics. A preliminary analysis of the obtained research results with average scores and number of indications, which will be used for the SWOT analysis, is presented below, detailed analysis is ongoing.

1. The importance of factors in selecting innovative products

The group of important factors for consumers in choosing an innovative product included: price (5.8 points), sales promotion (5.2 points), information on the beneficial effects of food on health (5.19 points) and the presence of indicators (5.08 points), information on the content of new ingredients in food and the use of new packaging systems that extend shelf life (4.98 points). On the other hand, the least important factors in this group were the innovative form of packaging construction (3.99 points) and advertising in the media (3.36 points). Detailed results are presented in Table 1.

Table 1. Average ratings of the importance of factors in the selection of an innovative product and its packaging

Factors in the selection of an innovative product and its packaging	Average ratings
Price	5.80
Sales promotion (e.g. price reduction, freebies, etc.)	5.20
Information on the beneficial effect of food on health	5.19
The presence of indicators providing information on the quality of the product or its storage conditions, e.g. freshness indicators	5.08
Information on the content of new food ingredients	4.98
Application of packaging systems affecting the extension of the product's durability	4.98
Information on a new taste and/or smell	4.85
Availability of the product in smaller packages allowing for single consumption	4.81
Availability of products in larger packages	4.71
Innovative type of packaging material	4.24
Innovative packaging construction form (shape)	3.99
Advertisement in the media	3.36

2. Importance of food packaging elements and features related to safety of use

The hierarchy of importance of these features showed that for consumers the most important features in terms of safety are the properties related to the possible migration of ingredients from the packaging material to the product (5.48 points), protection against quantitative losses (5.42 points), and protection against changes in consistency, taste and (or) smell (5.4 points). In general, all properties related to packaging safety were rated above 5 on a 7-point scale, i.e. they were considered important. Detailed results are presented in Table 2.

Table 2. Average ratings of the importance of food packaging elements and features related to safety of use

Food packaging elements and features related to safety of use	Average ratings
Possible migration of ingredients from the packaging material to the product	5.48
Protection against quantitative losses, e.g. spilling, spilling of the product	5.42
Protection against changes in consistency, taste and (or) smell	5.40
Presence of protection against undesirable opening	5.27
User safety (e.g. no sharp packaging elements)	5.22
Safety of use (resistance to deformation)	5.21
Presence of protections guaranteeing first use	5.19

3. Importance of packaging elements and features related to ease of use

In the research on the hierarchy of importance of packaging elements and features, features related to meeting social needs in terms of ease of use were also taken into account. The data obtained show that all the analyzed features related to the ease of use of food and beverage packaging that have a beneficial effect on human health are assessed by respondents as of medium importance. The ranking of the importance of these features, developed on the basis of the average importance rating, allowed for the selection of the most important in this group. Respondents gave the highest ratings to features such as: the possibility of multiple opening and closing of packages (5.29 points), stability (5.22 points) and ease of manipulation (5.15 points) as well as the method of opening and closing (5.14 points). The least important features were indicated as: the type of surface structure of the package (4.34 points) and the shape of the package (4.23 points). Detailed results are included in Table 3.

Table 3. Average ratings of the importance of packaging elements and features related to user convenience

Packaging elements and features related to user convenience	Average ratings
Possibility of multiple opening and closing	5.29
Packaging stability / no tipping over	5.22
Ease of manipulation	5.15
Method of opening / closing	5.14
Type of packaging material	4.99
Packaging capacity	4.86
Packaging weight	4.7
Packaging transparency / content visibility	4.64
Type of packaging surface structure	4.34
Packaging shape	4.23

4. Importance of information on food packaging

The next step was to analyze the results of research on the importance of information on food and beverage packaging that has a beneficial effect on human health. Analysis of the results in the table showed that of all the information on food and beverage packaging that has a beneficial effect on human health, the most important information for consumers is information on the price (5.73 points) and the composition of the product (5.69 points). Information on the extended shelf life of the product (5.41 points) and information on the beneficial effect on health (5.19 points) were also rated high in the hierarchy of features.

Information on the possibility of portioning the product (4.65 points) and information on the product brand (4.53 points) were rated the lowest. Detailed results are presented in Table 4.

Table 4. Average ratings of the importance of information on food packaging

Information on food packaging	Average ratings
Price	5.73
Information on the product composition	5.69
formation on the extended shelf life of the product	5.41
Information on the beneficial effect of the product on human health	5.19
Information on the possibility of preparing the product in the packaging	4.96
Pictograms/symbols presenting the method of handling the packaging after use	4.79
Signs identifying the type of packaging material	4.73
Information on the possibility of portioning the product	4.65
Brand name	4.53

5. The importance of environmentally related food packaging features and elements

The hierarchy of importance of these features showed that the most important features for consumers were: the susceptibility to recovery of the packaging after the packaging has been used (5.17 points) and the type of material used to produce the packaging (5.05 points). The least important features were: minimized packaging weight (4.75 points) and one or more types of materials used to produce the packaging (4.69 points). Detailed results are presented in Table 5.

Table 5. Average ratings of the importance of food packaging features and elements related to the environmental aspect

Features and elements of food packaging related to the environmental aspect	Average rating
Sustainability of packaging after the content has been used up	5.17
Type of material used to produce the packaging (glass, metal, plastic....)	5.05
Shape and design facilitating the return of post-consumer packaging to vending machines	4.78
Minimized packaging weight	4.75
One or more types of packaging materials used to produce the packaging	4.69

6. The importance of packaging features influencing the choice of food from the group of meat products, dairy products, fruit, and vegetable products

In the study of consumer needs regarding packaging for individual product groups, respondents indicated that for meat and dairy products the most important features were the price-quality ratio (5.66 points for meat, 5.65 points for dairy), product protection (5.69 points for dairy, 5.65 points for meat), lack of product-packaging interaction (5.65 points for dairy, 5.64 points for meat). On the other hand, for fruit and vegetable products the most important features were the price-quality ratio (5.62 points) and lack of product-packaging interaction (5.47 points).

In turn, the least important features for all the product groups analyzed were the appearance and aesthetics of the packaging (4.6 points for meat and dairy, 4.56 points for fruit and vegetables). Detailed results are presented in Table 6.

Table 6. Average ratings of the importance of packaging features influencing the choice of food

Packaging features that influence food choice	Average rating for meat products	Average rating for dairy products	Average rating for fruit and vegetable products
Economical (price-to-quality ratio)	5.66	5.65	5.62
Protection of the product against spillage, spillage, dirt, contamination	5.65	5.69	5.34
Safe contact of food with the packaging (no interaction)	5.64	5.65	5.47
Legibility and comprehensibility of information on the packaging	5.46	5.46	5.37
Resistance of the packaging, e.g. to crushing, falling, temperature, sunlight	5.42	5.53	5.37
Convenience and ease of use	5.3	5.37	5.14
Environmental (impact of the packaging on the environment)	5.1	5.14	5.17
Appearance and aesthetics of the packaging	4.6	4.6	4.56

7. Importance of features and elements of food packaging perceived by respondents as their imperfections

The obtained research results confirmed that all analyzed imperfections are rated relatively high. Features such as: poor legibility of information (5.38 points), difficulty in opening (5.2 points), lack of guarantee of first opening (5.19 points) and lack of possibility of re-closing (5.15 points) are features perceived by respondents as the most important packaging imperfections. In the opinion of consumers, other imperfections were also rated high (4.73-4.99

points), which indicates that individual packaging features are also a significant problem. Detailed results are presented in Table 7.

Table 7. Average ratings of the importance of features and elements of food packaging perceived by respondents as imperfections

Features and elements of food packaging perceived by respondents as their imperfections	Average ratings
Poor legibility of information	5.38
Difficulty to open	5.2
No guarantee of first opening	5.19
No possibility of re-closing	5.15
No opening facilities	4.99
No marking of the place of opening	4.92
Non-ergonomic shape of the packaging making it difficult to grip and hold in the hand	4.8
Lack of rigidity of the packaging (instability of the structure)	4.8
Too large size/capacity of the packaging	4.78
Inability to divide the contents of the packaging without having to open	4.76
Too large gross weight of the packaging (weight of the product together with the packaging)	4.73

8. Willingness to incur lower, equal or higher costs associated with the purchase of packaging that represents selected features

Among the surveyed respondents, the vast majority of respondents, regardless of the proposed features and packaging elements, declare their willingness to pay the regular price. For each packaging feature, the largest number of respondents selected the option "I will pay the regular price" (e.g. 678 people for more convenient packaging, 697 for better information about the content). This suggests that consumers appreciate these features but are not willing to incur additional costs. Relatively few people accept prices higher by 30% and 50% (e.g. only 17 people for more convenient packaging and 15 for environmentally friendly packaging). The maximum willingness to pay extra seems to end at a level of 10%-20% higher price. Packaging made of environmentally friendly materials and those with a lower environmental impact are more acceptable with small additional payments (228 people agree to a 10% higher price for packaging with a lower environmental impact). However, people who are willing to pay the regular price still dominate. Packaging with additional information about the product's freshness, better adapted to selective collection or with ease of use enjoys interest, but consumers do not want to pay significantly more for them. Detailed results are presented in Table 8.

Table 8. Number of indications of the possibility of paying lower, equal or higher prices for packaging with special features and properties

Selected features represented by the packaging	20% off regular price	10% off regular price	Regular price	10% more than regular price	20% more than regular price	30% more than regular price	50% more than regular price
More convenient packaging, equipped with elements that facilitate use	109	76	678	177	49	33	17
Packaging with a much smaller impact on the environment	105	93	547	228	108	31	27
Packaging that provides better information about the content	93	80	697	157	70	20	22
Packaging is equipped with additional elements informing about the freshness of the product	99	69	646	205	78	25	17
Packaging made of environmentally friendly materials	105	83	551	251	103	31	15
Packaging better adapted to selective waste collection	112	80	595	212	86	32	22

Detailed conclusions from the research on the selection of innovative products and food packaging

1. Factors in the selection of innovative products

- a. The price of the product is of key importance for consumers (5.80 points), which indicates high price sensitivity of buyers.
- b. Sales promotion (5.20 points) and information about the beneficial effect on health (5.19 points) are also important elements, which suggests that consumers pay attention to added value and marketing message.

- c. The least important in the choice of the product were the innovative construction form of the packaging (3.99 points) and advertising in the media (3.36 points), which indicates that consumers are more guided by specific functional aspects of the product than by the general appearance or advertising campaigns.

2. Safety of use of packaging

- a. The most important factor for consumers is the lack of migration of substances from the packaging to food (5.48 points), which emphasizes the importance of health aspects.
- b. Protection against quantity losses (5.42 points) and changes in the consistency, taste and smell of the product (5.40 points) are also important, which confirms consumers' expectations regarding maintaining high food quality.

3. Convenience of using packaging

- a. Of key importance for consumers is the ability to open and close the packaging multiple times (5.29 points), stability (5.22 points) and ease of manipulation (5.15 points).
- b. The least importance was assigned to the type of surface structure of the packaging (4.34 points) and its shape (4.23 points), which suggests that functionality is more important than aesthetic aspects.

4. Importance of information on packaging

- a. The price of the product (5.73 points) and information on the composition (5.69 points) are the most important factors in deciding on the choice of the product.
- b. Information on durability (5.41 points) and beneficial effects on health (5.19 points) were also highly rated, which shows that consumers expect reliable data on the composition and storage.

5. Environmental aspects of packaging

- a. Consumers prefer packaging that is recyclable (5.17 points) and made of appropriate materials (5.05 points), which indicates growing environmental awareness.
- b. Less importance was attributed to the weight of the packaging (4.75 points) and the number of types of materials used in production (4.69 points).

6. Impact of packaging on food selection

- a. For all product groups (meat, dairy, fruit and vegetables), the most important features were the price-quality ratio (approx. 5.65 points) and the lack of interaction between the product and the packaging (approx. 5.65 points for dairy and meat products, 5.47 points for fruit and vegetables).
- b. The appearance and aesthetics of the packaging were of the least importance (approx. 4.6 points), which shows that consumers prioritize functionality over aesthetics.

7. Packaging imperfections

- a. The most bothersome defects are poor legibility of information (5.38 points), difficulty in opening (5.2 points) and no guarantee of first opening (5.19 points).
- b. This indicates the need to improve the ergonomics and legibility of labels on packaging.

8. Price

- a. Consumers are reluctant to pay extra for additional packaging features.
- b. Ecological options are gaining popularity, but to a limited extent. Information and convenience are desirable, but their value in the eyes of customers does not translate into a willingness to pay a higher price.
- c.

General conclusions from the research on the selection of innovative products and packaging features

1. Price and promotion as key selection factors

Consumers attach the greatest importance to the price of the product and sales promotion. At the same time, information on health benefits and the content of innovative ingredients are important.

2. Importance of safety and functionality of packaging

In the context of safety of use, aspects related to product protection and protection against unwanted opening are key. Convenience of use is also important, especially the possibility of opening and closing the package multiple times.

3. Importance of information on packaging

The most valued information is on the price and composition of the product, as well as information on its durability and impact on health. Information on the brand or the way of portioning is less important.

4. Environmental aspects are gaining importance

Consumers pay attention to the possibility of recovering packaging and the type of materials used, although these issues remain less important than price and functionality.

5. Expectations towards packaging for various product categories

For meat, dairy and fruit and vegetable products, the price-quality ratio and product safety are key. The aesthetics of the packaging play the least important role.

6. Most frequently indicated packaging imperfections

Consumers point to difficulties related to the legibility of information, opening and re-closing of packaging, which indicates the need to optimize their use.

7. Costs of purchasing packaging with new features or additional utilities

Most consumers prefer packaging with better features, but are not willing to pay a significantly higher price for them, with the greatest acceptance being small surcharges for ecological options.