OP-176 [Beekeeping Economy]
Decoding Honey: A Comprehensive Melissopalynological Analysis of Georgian Honey and Consumer Preferences

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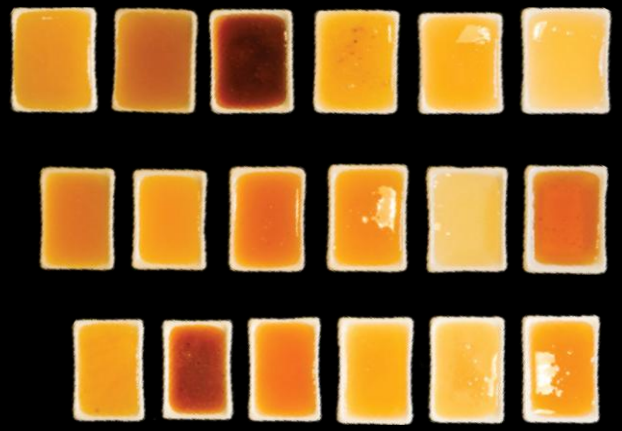
Georgia's rich floral biodiversity supports a diverse honey industry; however, the identification, classification, authenticity verification, and market positioning of Georgian honey remain underdeveloped. Despite its diversity, limited research on regional composition and consumer behavior constrains its market potential and the growth of beekeeping entrepreneurship. Here, we present a nationwide melissopalynological analysis of 123 honey samples from 62 municipalities, covering the entire country. For the first time, we identified 18 distinct honey types, with 11 classified as common (represented by multiple samples) and 7 as rare (represented by a single sample). Based on these findings, the common varieties were selected for a blind tasting experiment involving 152 consumers, which highlighted chestnut and acacia honey as the most preferred types, with taste, color, and consistency emerging as key purchasing factors.

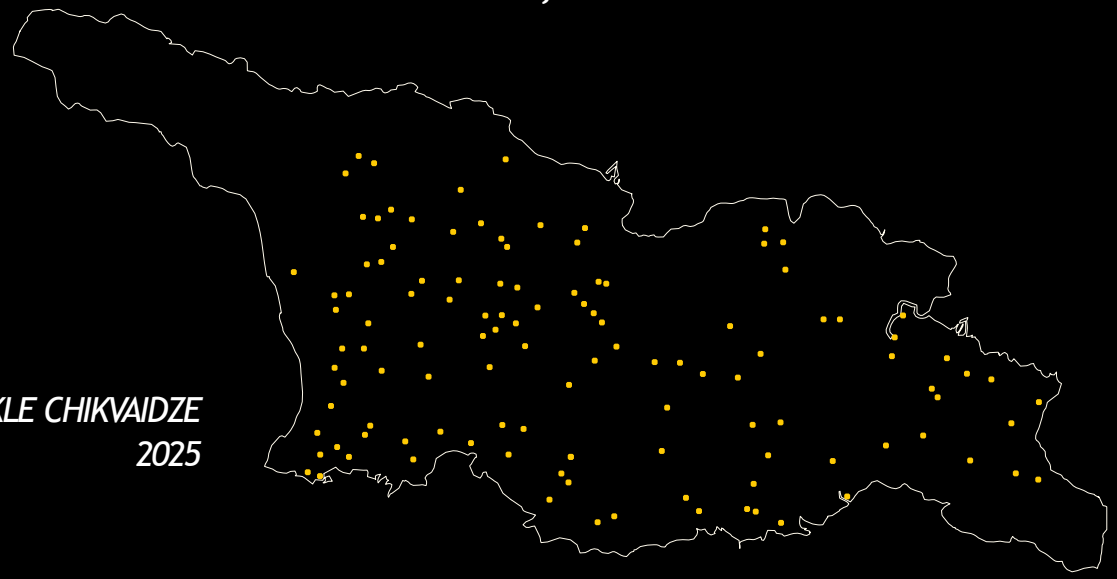
This study aims to bridge research and practice by enhancing the understanding of Georgian honey's geographical distribution and floral sources while aligning production strategies with consumer behavior insights. Our findings highlight the need for improved sales marketing approaches, including targeted branding, sensory-driven promotion, and diversified product positioning to increase consumer engagement. Strengthening rural economies will not only enhance the credibility but also improve the global competitiveness of Georgian honey.

GEORGIAN BEEKEEPERS UNION



DECODING GEORGIAN HONEY

Comprehensive Melissopalynological Analyses and Consumer Preferences



EREKLE CHIKVAIDZE

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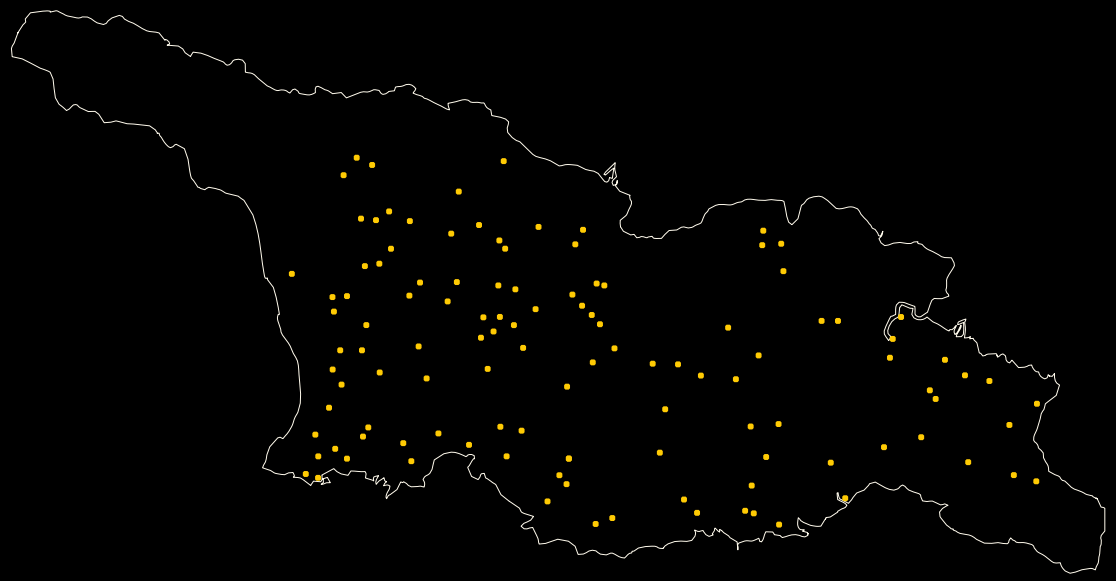
Austrian Development Agency

ALCP | Alliances Caucasus 2

REGIONAL MARKET ALLIANCES IN THE SOUTH CAUCASUS

STUDY AREA



123 SAMPLES

10 REGIONS

61 MUNICIPALITIES

THIS RESEARCH AIMS TO:

Classify Georgian honey by botanical and geographical characteristics.

Assess consumer preferences for commonly available honey types.

Provide recommendations for improving honey production and marketing in Georgia.

Scan Me For the Interactive Map

METHODOLOGY

Melissopalynology is a classical method used for honey authentication. When combined with selected physicochemical parameters, it provides more accurate results. However, more modern and costly approaches, such as NMR profiling, infrared spectroscopy, and molecular techniques, are also applied. In global honey trade, authentication commonly relies on a combination of both classical and modern methods.

*DIN 10760 is a German standard titled **"Analysis of honey – Determination of the relative frequency of pollen"**. Published in May 2002 by the Deutsches Institut für Normung (DIN), this standard outlines a method for determining the relative frequency of pollen in honey samples. The standard is primarily used to assess the botanical and geographical origin of honey, which is essential for quality control and authenticity verification.*

FOR HONEY CLASSIFICATION

Determination of Geographical and Botanical Origin
Pollen composition
Yeast Content
Color
Consistency
Aroma
Electrical conductivity

FOR CONSUMER PREFERENCES

Sociodemographic
Purchasing Behavior
Blind Tasting and Consumption choice
Willingness to Purchase
Factors Affecting Purchasing Behavior

HONEY CLASSIFICATION

123 honey samples

1,935 pollen grains

162 plant types

69 plant families

Honey types represented by multiple samples were classified as common (11 Types), whereas those represented by a single sample were classified as rare (7 Types).

Scan Me for Interactive Data Analyses

Robinia Pseudoacacia

Apiaceous

Lotus Carniculatus

Centaurea Jacea

Unidentified

Honeydew

Paliurus spina-christi

Thymus vulgaris

Amorpha fruticose

Myosotis spp.

Trifolium repens

Multiflora

Solidago spp.

Hedera helix

Tilia spp

Castanea sativa

Alpine Multifora

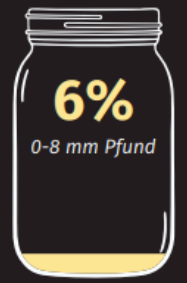
Pyrus Prunus Rubus

COLOR PROFILES

Among the seven recognized honey color types, all were represented except dark amber, which was absent. The most abundant type was extra light amber. Further research is ongoing to identify dark amber honey types and characterize their properties

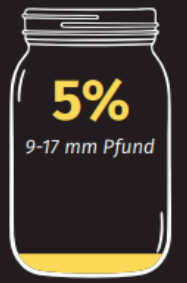
Pfund Scale: A standard scale (mm) used to measure honey color based of United States standards for grades of extracted honey, ranging from "water white" to "dark amber."

Water White



Acacia-100%
Blossom-13%

Extra White



Blossom-13%
False Indigo-100%
Honeydew-3%
White Clover-29%

WHITE

Alpine-14%
Apiaceae-100%
Blossom-25%
Brown Knapweed-100%
Common Thyme-100%
Forget-Me-Not-20%
Fruit-14%
Goldenrod-67%
Honeydew-10%
Linden-9%
White Clover-14%
Unknown-100%

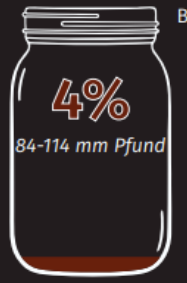
Extra Light Amber

Alpine-79%
Blossom-31%
Christ's Thorn-100%
Honeydew-50%
Forget-Me-Not-80%
Fruit-29%
Goldenrod-33%
Linden-91%
Chestnut-18%
White Clover-57%

Light Amber

Alpine-7%
Blossom-13%
Chestnut-64%
Honeydew-33%
Fruit-57%
Ivy-100%

Amber



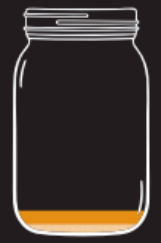
Bird's-foot Trefoil-100%
Blossom-6%
Chestnut-18%
Honeydew-3%

CONSISTENCY PROFILES

Most Georgian honey varieties are partially crystalline, with only 21% occurring in liquid form. The liquid form was the most preferred by participants when making their choice. Cream honey was associated with the presence of cucumber pollen.

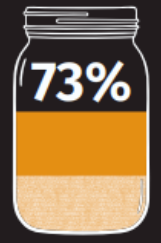
21% LIQUID

Acacia-100%
Blossom-25%
Chestnut-73%
Honeydew-27%



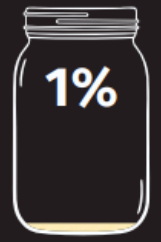
5% STARTING CRYSTALLISATION

Christ's Thorn-4%
Honeydew-10%
Fruit-14%



73% PARTLY CRYSTALLINE

Alpine-100%
Apiaceae-100%
Bird's-foot Trefoil-100%
Blossom-69%
Brown Knapweed-100%
Christ's Thorn-86%
Common Thyme-100%
False Indigo-100%
Forget-Me-Not-100%
Fruit-86%
Goldenrod-100%
Honeydew-63%
Ivy-100%
Linden-91%
Chestnut-18%
Unknown-100%
White Clover -100%



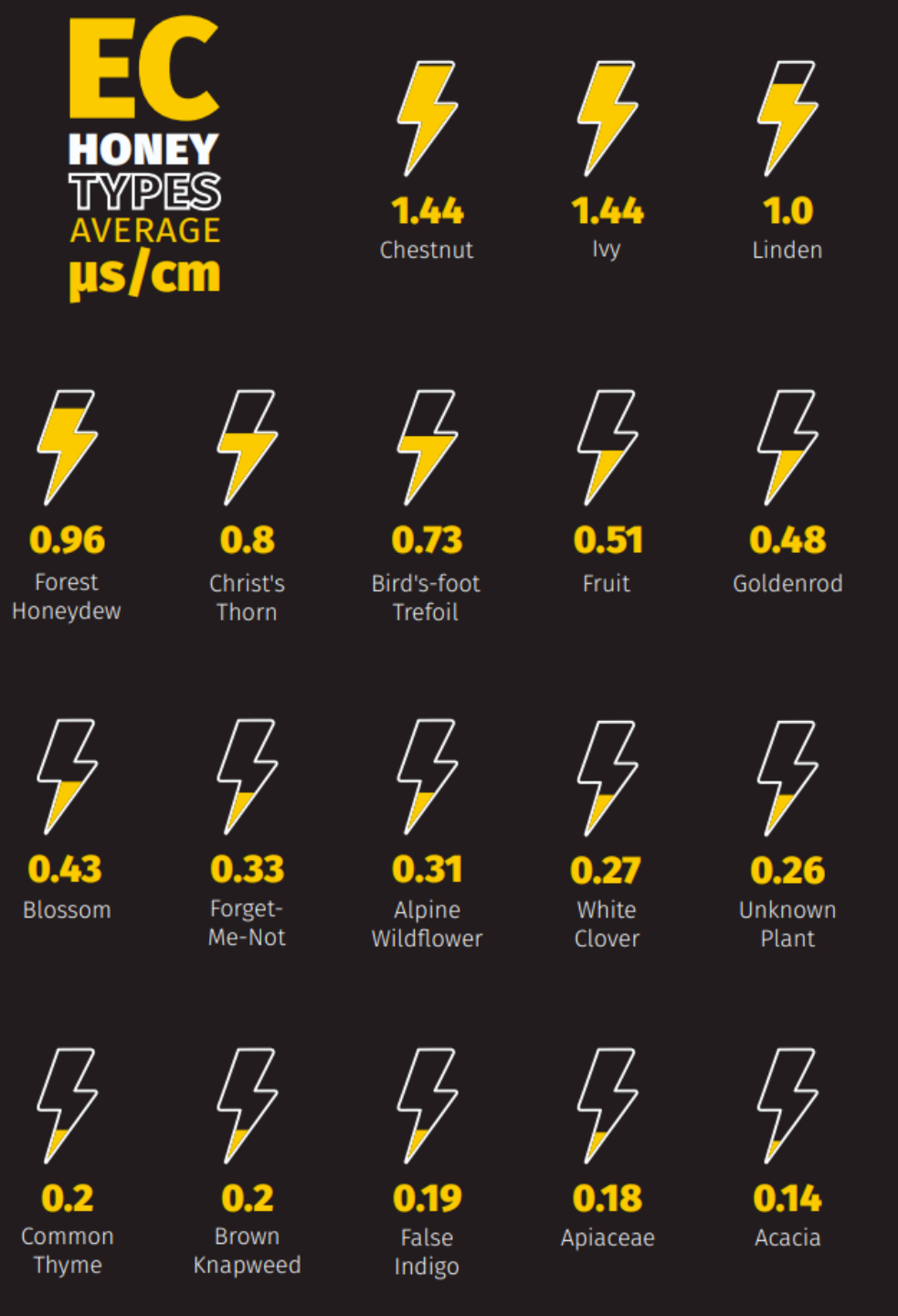
3% CREAMY

Blossom-6%

ELECTRICAL CONDUCTIVITY

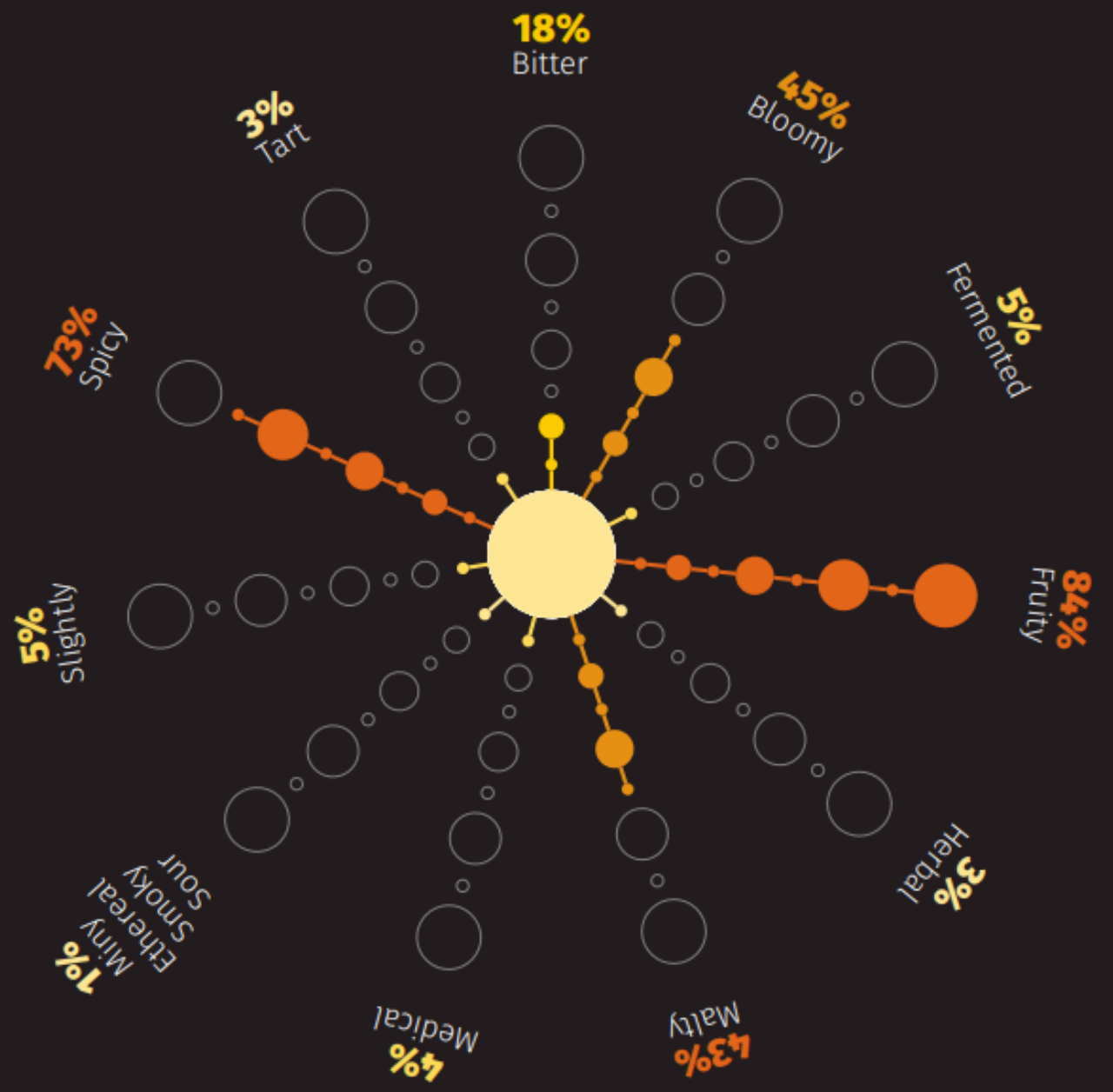
The minimum electrical conductivity observed was 0.13 mS/cm, while the maximum reached 1.77 mS/cm

Electrical conductivity measures the ability of a honey solution to conduct electricity, which depends on the concentration of mineral ions (e.g., potassium, calcium, magnesium). It is a key measure for assessing honey authenticity and differentiating between floral and honeydew honeys.



TASTE PROFILES

Globally, most honey is characterized by fruity notes. In contrast, Georgian honey exhibits pronounced spicy, floral, malty, and bitter flavors, largely attributed to the presence of chestnut pollen found in nearly all samples, along with contributions from *Pyrus*, *Prunus*, and *Rubus* grains

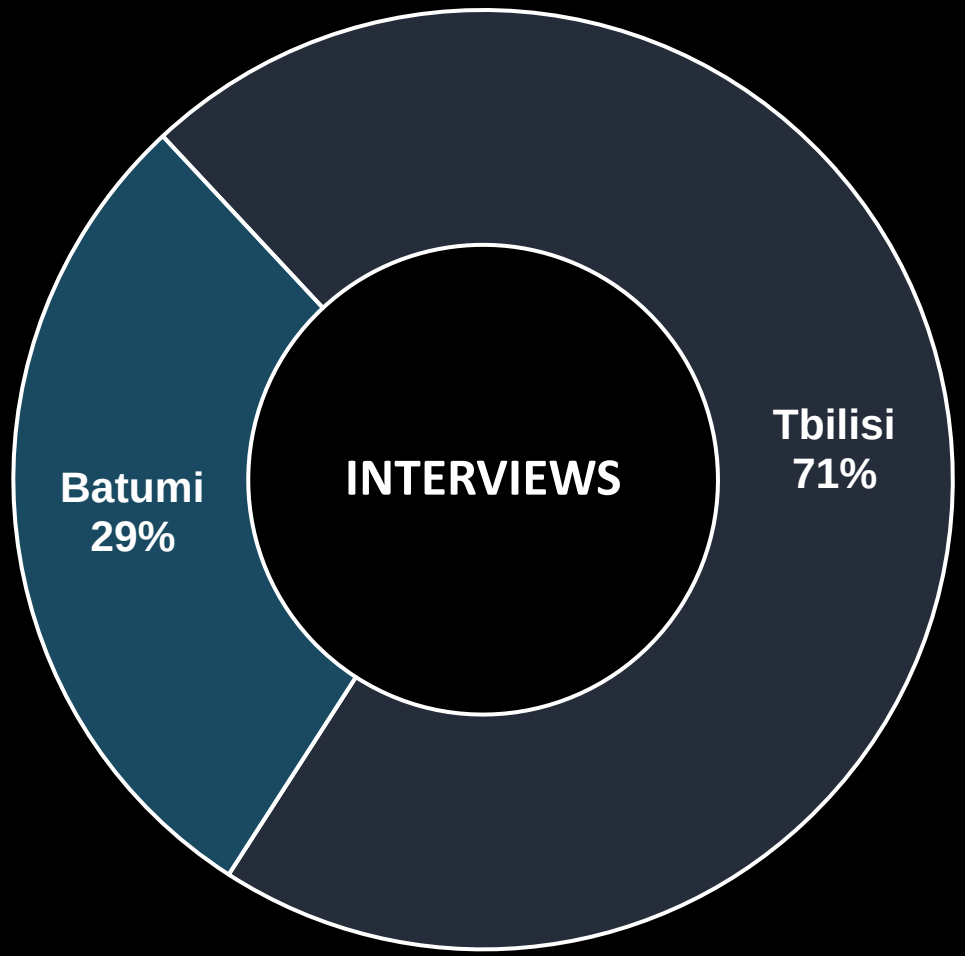


CONSUMERS PREFERENCES

BLIND TASTING

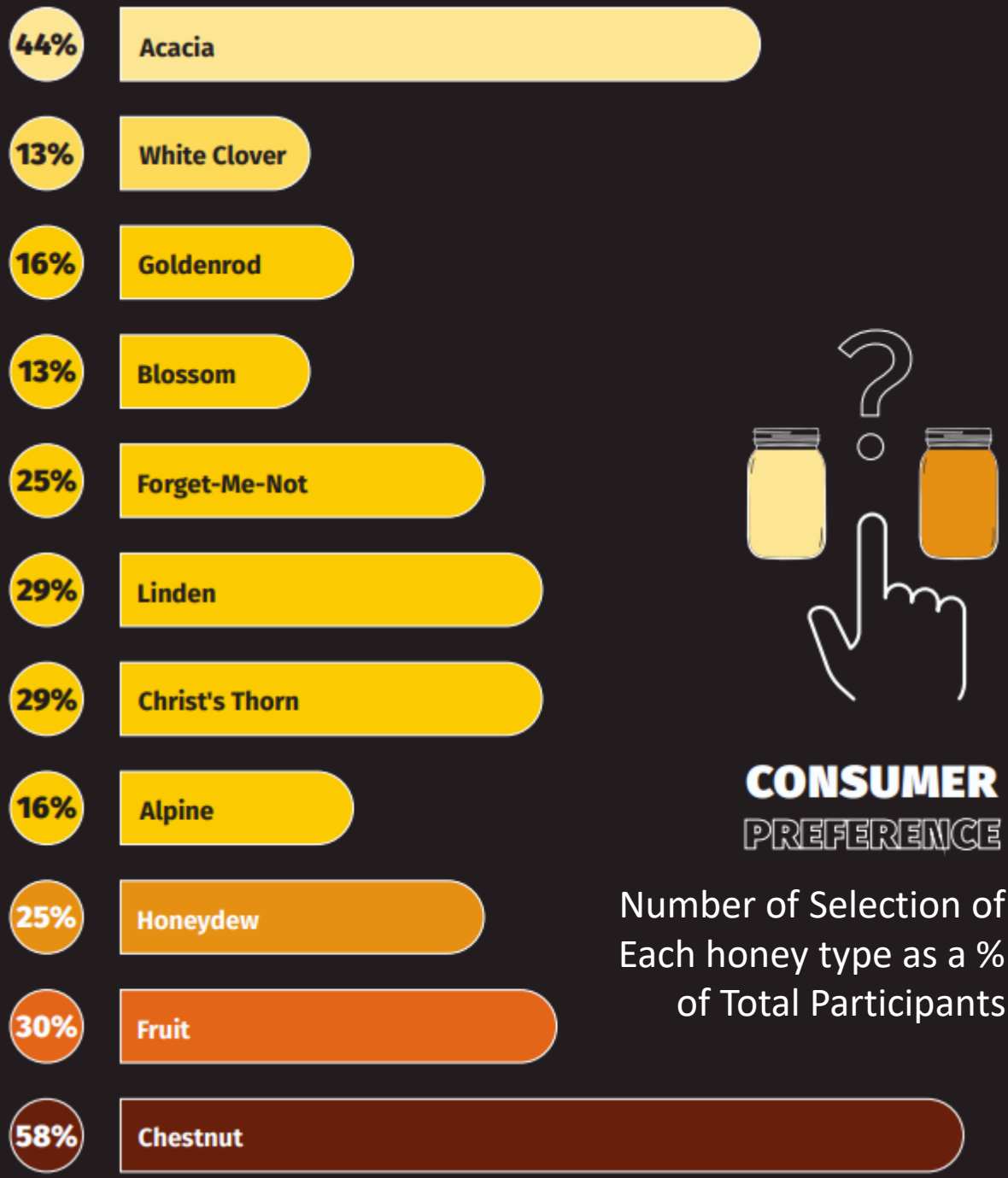
152
PARTICIPANTS

- TBILISI
- BATUMI



CONSUMER PREFERENCES

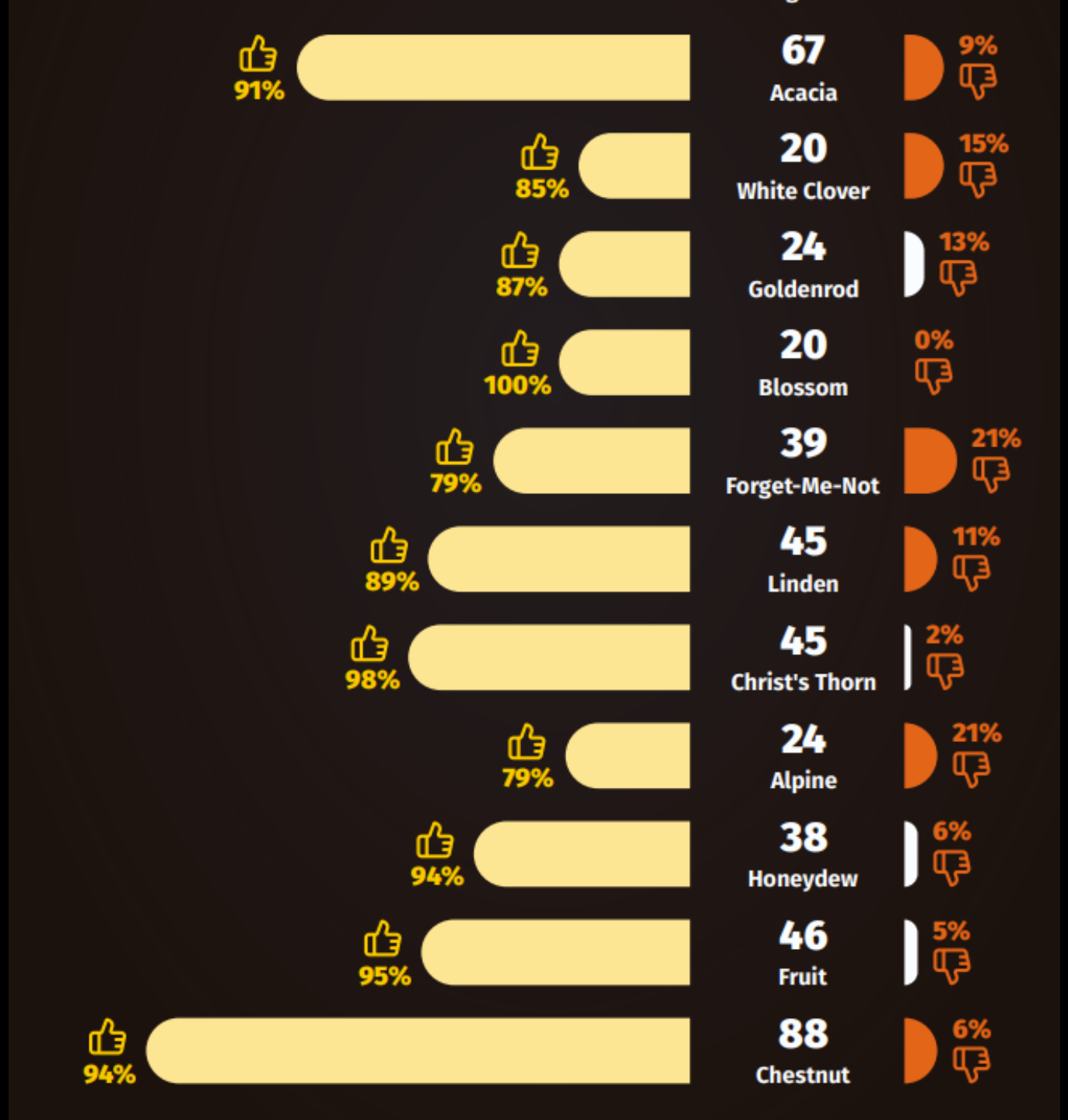
Each of the 152 participants selected 3 samples out of 11, based solely on visual assessment (color and consistency). Acacia and chestnut honey were identified as the most selected.

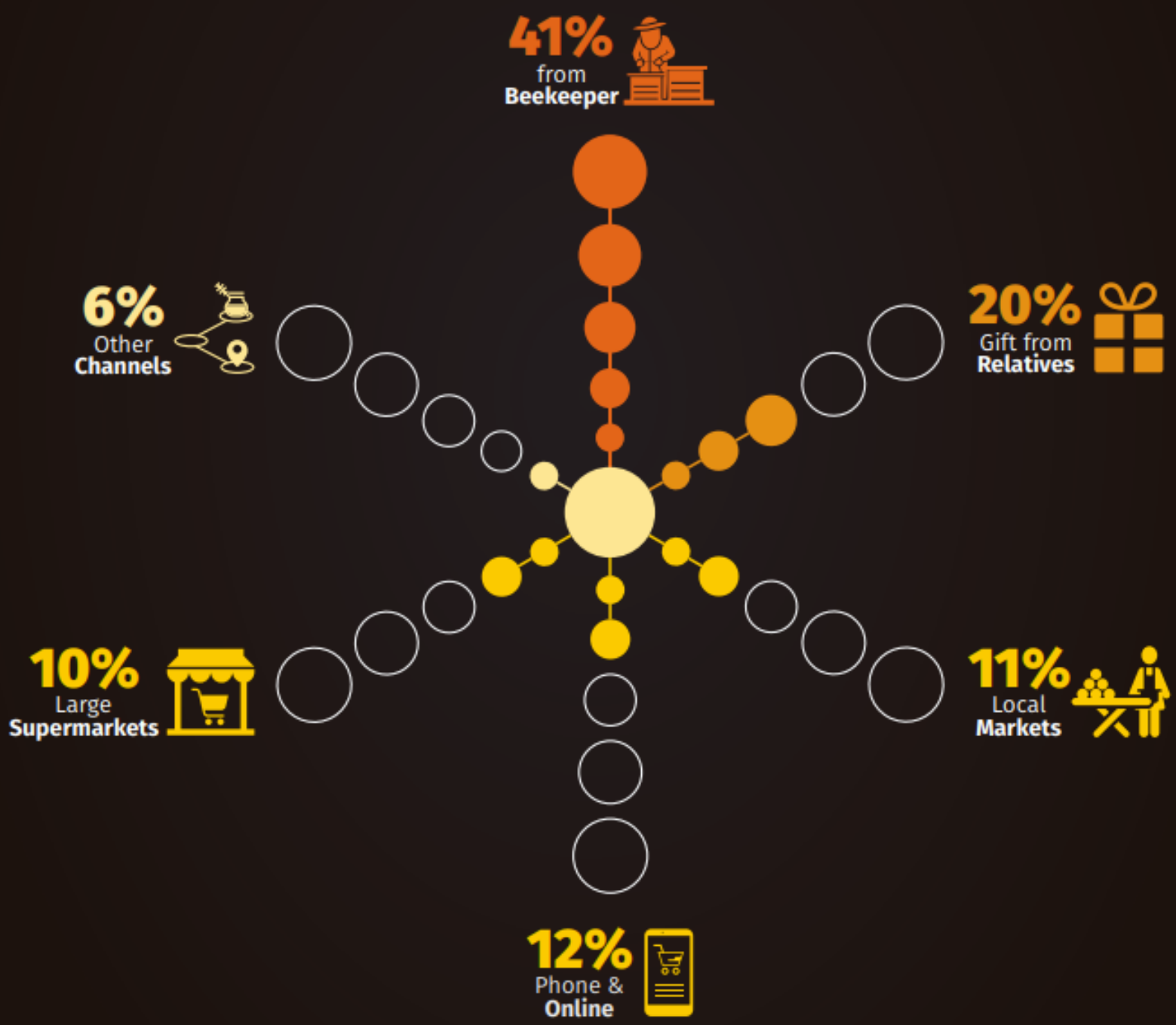


Number of Selection of Each honey type as a % of Total Participants

CHOOSING & RANKING TOP 3 HONEY TYPES

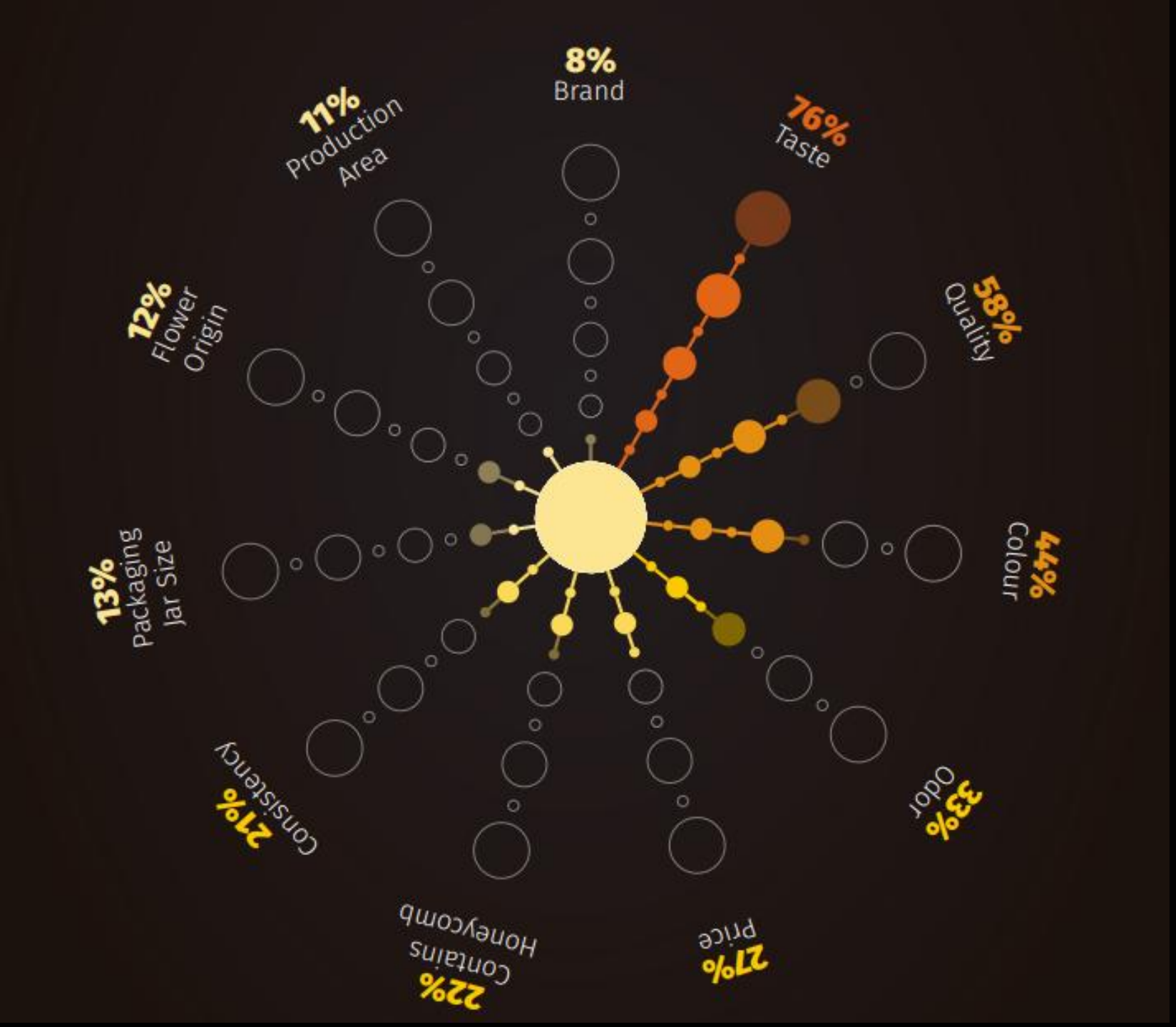
After tasting, participants indicated whether they liked or disliked each honey type.





PURCHASING CHANNELS

Participants demonstrated a strong tradition of purchasing honey directly from beekeepers, as well as receiving it as a gift from relatives. On a global scale, Georgia's annual per capita honey consumption is 0.52 kg

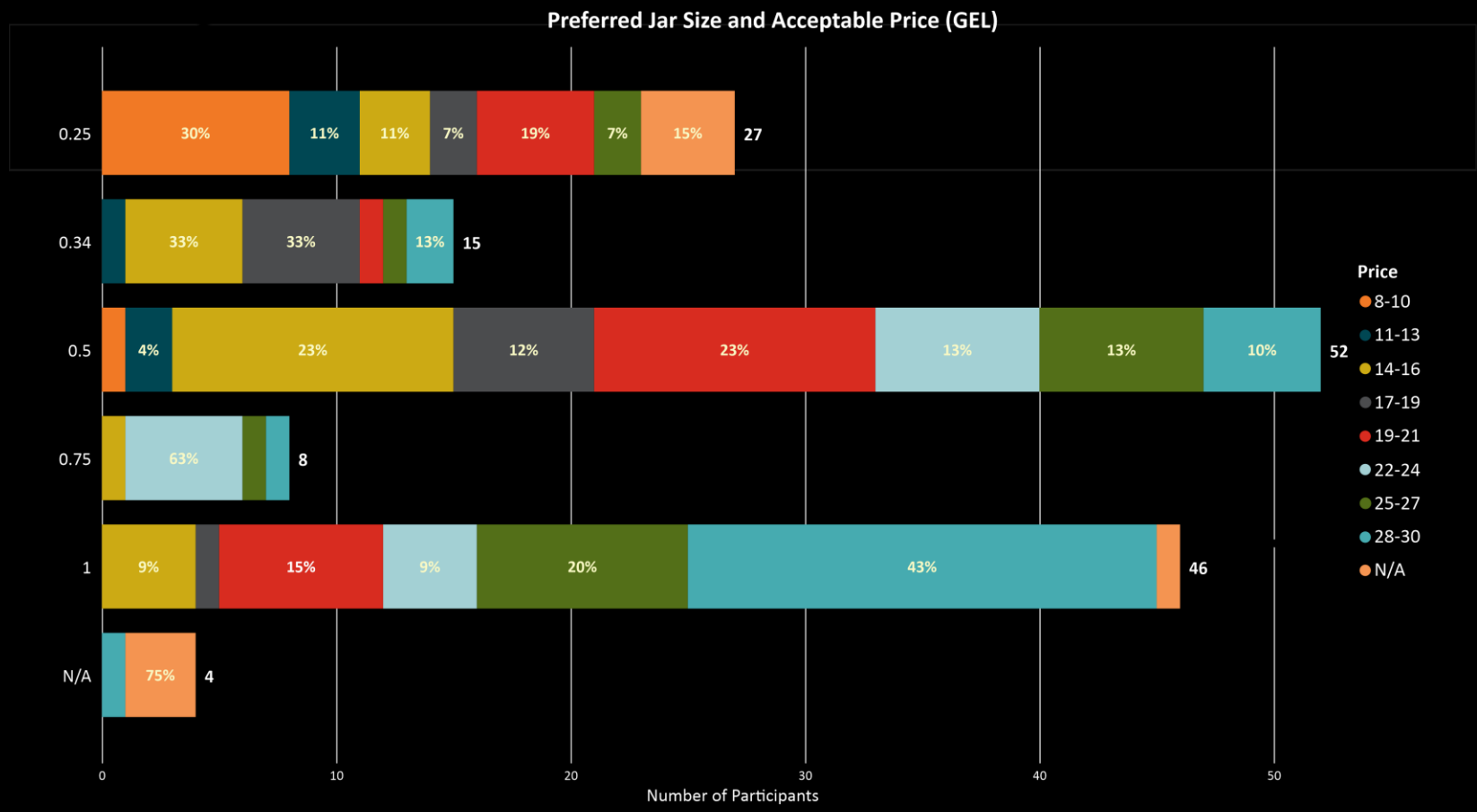


FACTORS INFLUNCING PURCHASING BEHAVIOUR

Taste, quality, and color were the main factors influencing purchasing behavior. Only 8% of consumers considered brand important, as most purchase honey directly from beekeepers

PREFERED JAR SIZE AND ACCEPTABLE PRICE

Five jar sizes were presented to participants, who were asked to indicate their preferred size and the price they would be willing to pay. Interestingly, participants tended to choose round sizes such as 0.5 kg rather than 0.34 kg. The most preferred size was 0.5 kg, selected by 52% of respondents



USEFULNESS OF THE DATA

Identification and geographical labeling of honey types significantly enhance marketability. For example, in the United States there is strong demand for white clover honey, and three regions of Georgia produce this variety. Recently, I met potential clients from France interested in *Thymus vulgaris*, a honey type that had not previously been documented in Georgia until this research.

The impact of honey crystallization on consumer perception and sales is another important factor. Producers need to recognize that crystallization often raises doubts among consumers, making it difficult to build trust. Therefore, improved production standards are needed to better align with consumer expectations.

This research also contributes to the establishment of a Georgian pollen database. The database is structured to allow additional melissopalynological data to be integrated over time, with the ultimate goal of achieving full coverage of all regions within a 3 km radius. Such a resource will facilitate more accurate mapping of honey origins and support the careful planning of transhumance routes.

THANK YOU!