
A VALUABLE TOOL FOR NEW PRODUCT DEVELOPMENT: CONSUMER ACCEPTANCE OF CREAMED HONEY

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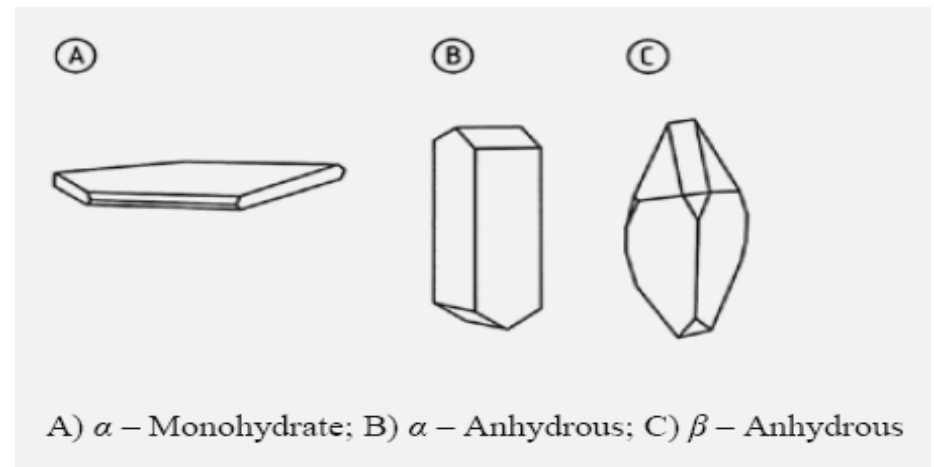


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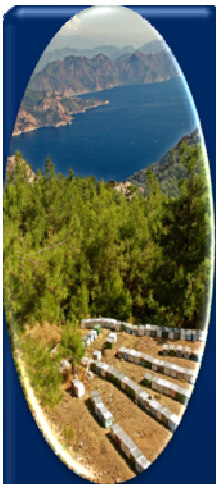


NEW PRODUCT FOR TURKEY

- ◆ Creamed honey is a product of the deliberate, controlled crystallization of honey.
- ◆ Creamed honey spreads like butter at room temperature and have very fine crystals.



Crystal forms of glucose



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OBJECTIVES

- ◆ To investigate crystallization behavior of honeys produced in Turkey from different geographical and botanical origins.
- ◆ To select the most suitable honey for the production of creamed honey.
- ◆ To determine the most suitable production process parameters for creamed honey.



Sunflower

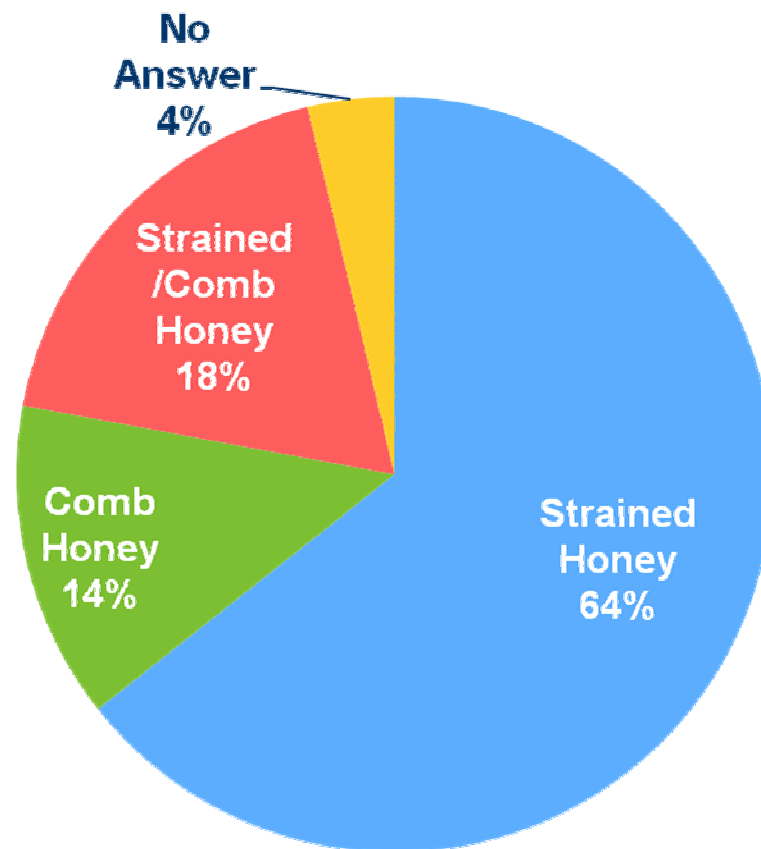


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CONSUMPTION HABITS IN TURKEY

- ◆ Average annual honey production is 50.000 tons.
- ◆ Annual consumption per capita: 600g
 - ◆ %90-95 strained
 - ◆ %5-10 comb honey



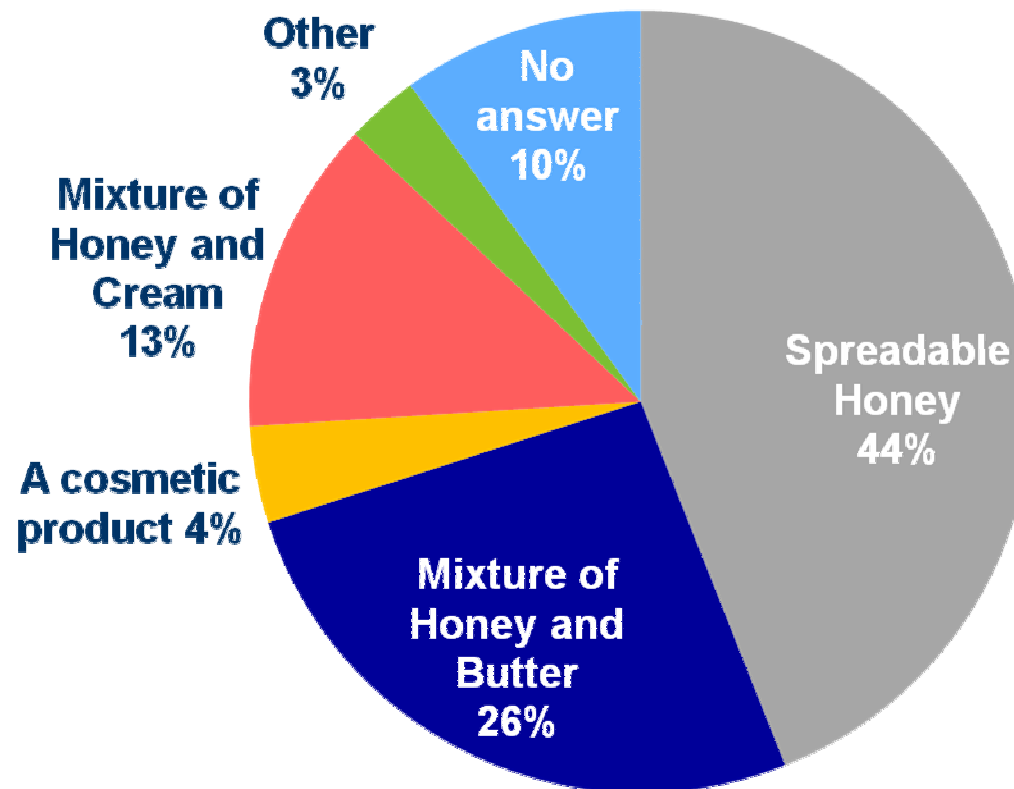
What types of honey do you eat?
Consumer Survey (354 persons)



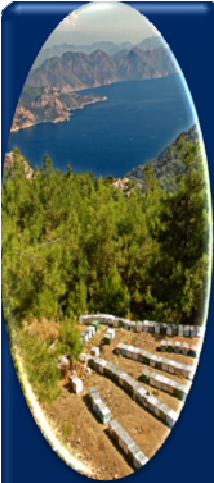
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WHAT IS CREAMED HONEY?



Consumer Survey (354 persons)



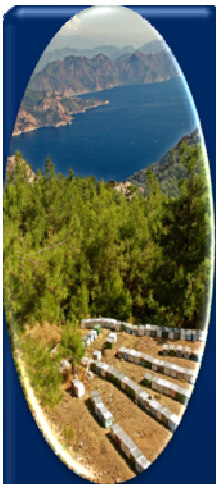
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QUALITY PARAMETERS

- ◆ Easily spreadable
- ◆ Creamy
- ◆ Fine crystals
- ◆ Shelf Life
Stability
 - Non-fermented
 - No phase separation
 - Non-foaming



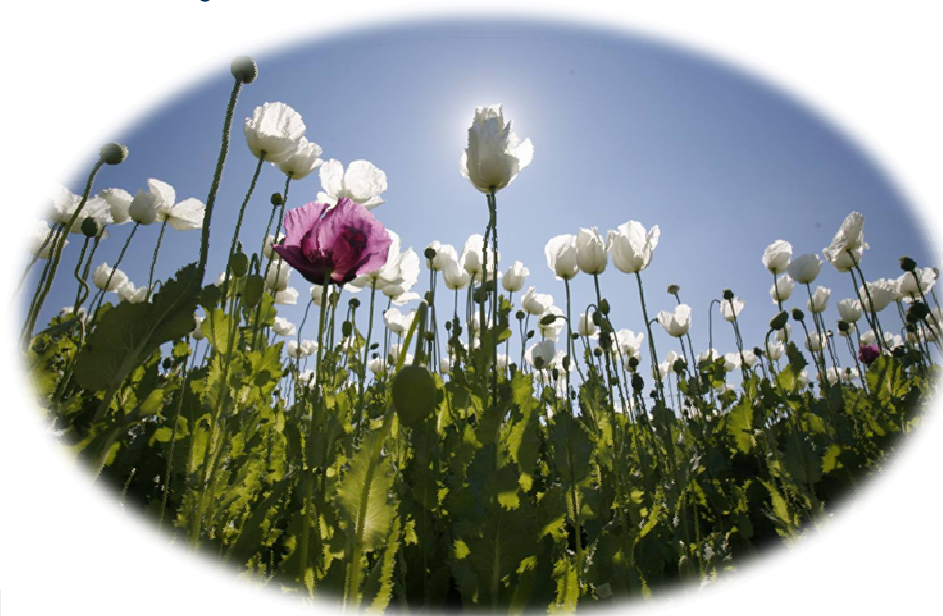


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PROCESSING PARAMETERS

- ◆ Origin of honey
- ◆ Moisture content of honey
- ◆ Amount of starter
- ◆ Starter crystal size
- ◆ Mixing speed
- ◆ Mixing time
- ◆ Temperature
- ◆ Cold storage period
- ◆ Production technology (bubbles in jar, temperature fluctuations etc.)





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PRE-EXPERIMENT










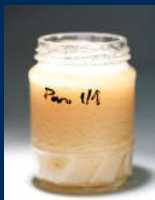
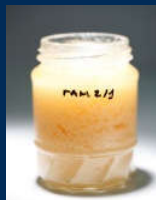
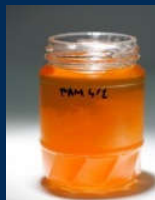

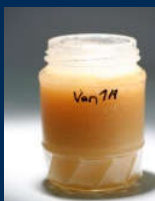
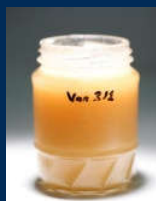

- ◆ To investigate crystallization behavior of different honey types:
- ◆ Poliflora honeys from Şemdinli, Yüksekova, Van, Kayseri and Bingöl
- ◆ Monoflora honeys such as Sunflower, Canola, Citrus, Eucalyptus and Cotton
- ◆ Storage Conditions: 4 °C, 14 °C and room temperature (20-24 °C) for 200 days.
- ◆ At the end of 200 days samples were analyzed by DSC (Differential Scanning Calorimeter) to determine their melting enthalpies.



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PRE-EXPERIMENT

Types of Honey	Initial Condition	After 200 days		
		4 °C	14 °C	Room Temperature
Canola Honey				
Citrus Honey				
Cotton Honey				
Van Honey				



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LABORATORY EXPERIMENTS

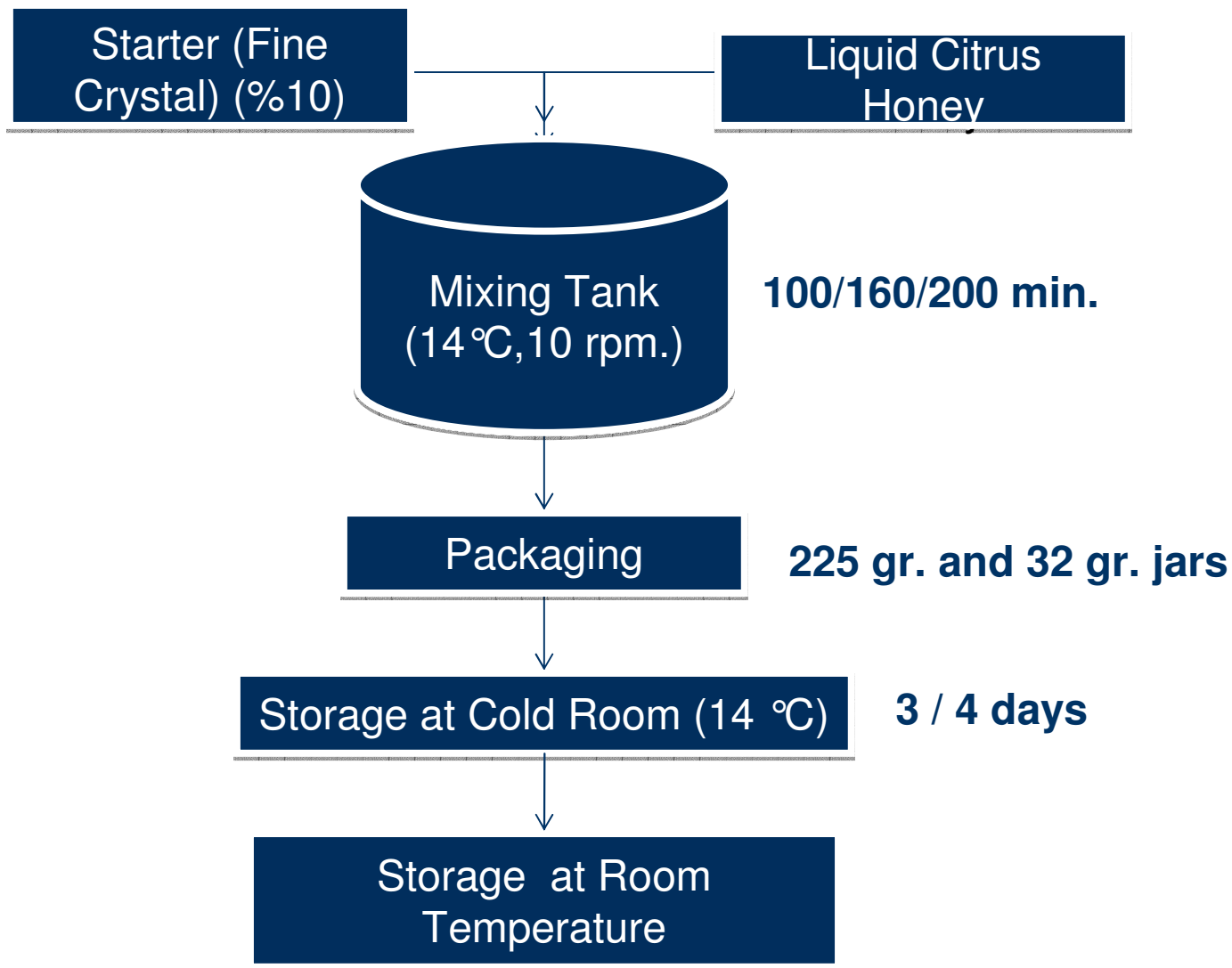
- To determine processing parameters, a bench scale experiment was carried out;
 - Cotton and citrus honey
 - Amount of starter (5-20%)
 - Mixing time (15-360 min.)
 - Mixing speed (5-300 rpm.)
 - Cold storage period (6 hours to 7 days)
 - Cold storage temperatures (8 °C, 14 °C, 18 °C)

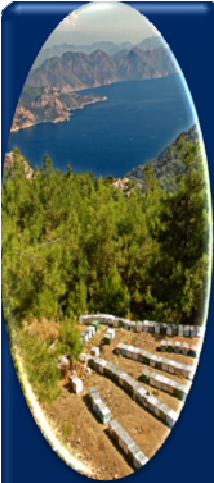


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PILOT SCALE PRODUCTION





PRODUCTION OF CREAMED HONEY

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Grinding crystals



Tank



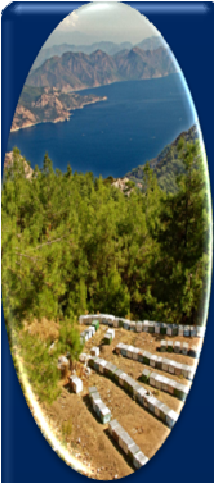
Addition of Starter



Filling



Cold Storage



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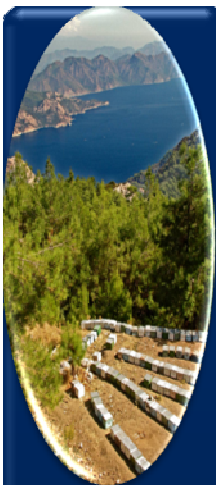


CONSUMER PREFERENCE TEST



**Sensory Analysis
(International Food
Exhibitors)**

To determine consumer likings, two- alternative forced choice test together with paired comparison test was used.



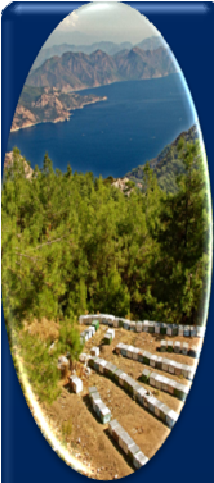
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EXPERIMENTAL DESIGN

Mixing Time (min.)	100	100	160	160	200	200
Cold Storage (14 °C)	3 days	4 days	3 days	4 days	3 days	4 days
Code	a	b	c	d	e	f
a	-	ab	ac	ad	ae	af
b	ba	-	bc	bd	be	bf
c	ca	cb	-	cd	ce	cf
d	da	ab	dc	-	de	df
e	ea	eb	ec	ed	-	ef
f	fa	fb	fc	fd	fe	-

Total 30 pairs



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APPLICATION of PANELS

- ◆ A total of 540 untrained panelists tested 30 pairs.
- ◆ Each pair was presented to one panelist randomly.
- ◆ Panelists were directed to taste the samples from left to right so the presentation of samples was balanced.
- ◆ Each pair was tested by 18 different panelist.



(İstanbul Gastronomi Festivali)



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PANEL FORM

Could you please give information about yourself.

Gender ☐ Female ☐ Male

Age ☐ <21 ☐ 21-35 ☐ 36-50 ☐ 51-75 ☐ <75

Education ☐ Secondary School ☐ High School ☐ Bachelor's ☐ Master ☐ Doctor's Degree

How often do you eat honey

☐ Every Day ☐ Once or twice in a week ☐ Once or twice in a month ☐ Once or twice in a year ☐ I don't eat

How much did you like the products?

Which one did you like more ?

What is your intention to buy those products?

Samples Code	I will definitely buy	Probably	Maybe Yes Maybe No	Probably I won't buy	I definitely won't buy
.....					
.....					

Demographic information

Preference

Purchase intent

Thank you very much for your attention

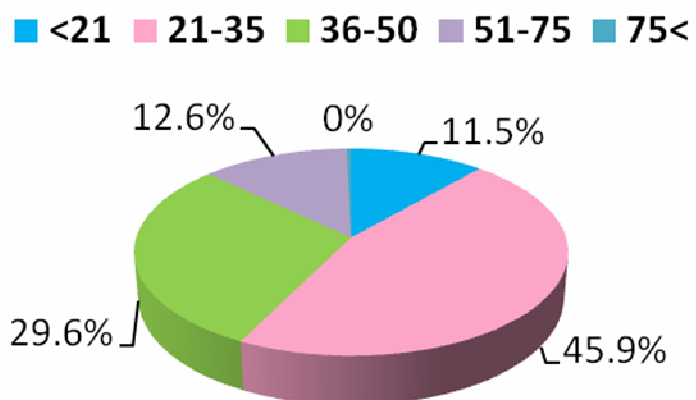


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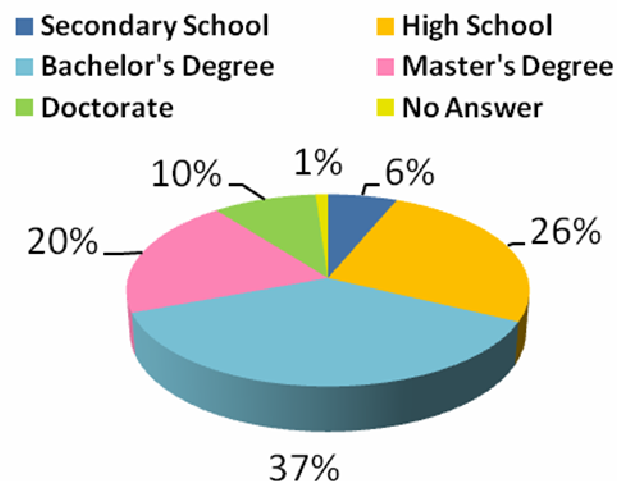


DEMOGRAPHICS OF PANELISTS

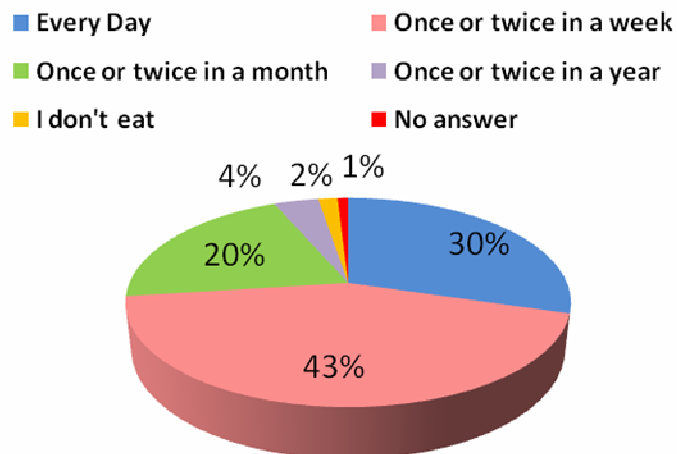
Age



Education



How often do you eat honey?





RESULTS

To determine preferences, Friedman test and Tukey's Honestly Significant Difference (HSD) ($p \leq 0.05$) test was used

Mixing Time (min.)	100	100	160	160	200	200
Cold Storage	3 days	4 days	3 days	4 days	3 days	4 days
Codes	A	B	C	D	E	F
A		8	6	9	12	13
B	6		13	4	10	10
C	7	10		12	9	9
D	5	10	8		10	7
E	10	9	6	12		9
F	11	8	4	9	8	
Rank Sum	126	133	121	132	144	136

Number of likings

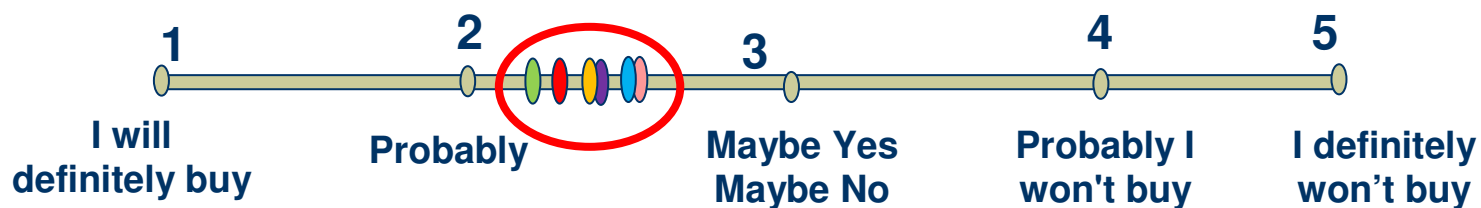
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RESULTS

To reveal the purchase intent of panelists univariate ANOVA ($p \leq 0.05$) test was performed.

Purchase Intent						
Mixing Time (min.)	100	100	160	160	200	200
Cold Storage (days)	3	4	3	4	3	4
Codes	A	B	C	D	E	F
Average	2,4	2,3	2,2	2,4	2,5	2,5





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CONCLUSION

- ◆ Consumers preferred the samples mixed for 160 min. and cold stored for 3 days (mildly soft consistency).
- ◆ Cream honey is a new and unknown product for Turkish consumers.
- ◆ Promising (consumers show an intent to buy) product.
- ◆ The product must be presented to the market and the consumers.



THANKS...

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