

Relation between sensory characteristics and consumer preference for traditional Belgian cheeses



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Objectives

There is a wide variety of traditional cheeses in Belgium, each with complex sensory characteristics. But little is currently known about adolescents’ consumption and preferences regarding these cheeses.

AIMS:

- ✓Examine the cheese preferences (related to salt, fat and umami content) and cheese acceptability of adolescents
- ✓Determine if adolescents with high nutritional knowledge prefer the low fat / low salt cheese.



Materials & methods

PRODUCTS:

Six commercial traditional Belgian cheeses:

- Salt content
 - Nazareth light (low)
 - Nazareth classic (high)
- Fat content
 - Belgolight Jong (low)
 - Dixmuda Jong (high)
- Umami content
 - Brugge Jong (low)
 - Brugge Belegen (high)

DISCRIMINATIVE SENSORY TEST

- 22 panelists
- Balanced reference duo-trio test
- Paired comparison test

CONSUMER SENSORY TEST

- Questionnaire on paper
 - Eating habits of cheese
 - Acceptability, preferences and characteristics of the cheeses
- Nutritional knowledge test (NKT) (Sichert-Hellert et al., 2011)
- Socio-demographic information

STATISTICS

- Chi² test
- IBM SPSS® 22

RESPONDENTS

- 220 Belgian adolescents
- Aged 11- 14 years
- 60% boys
- 58% city / 42% countryside



Results

DISCRIMINATIVE SENSORY TESTS

Duo-trio test

	Correct answers	Correct answers in %
Salt	12	54,55
Fat	18*	81,82
Umami	13	59,09

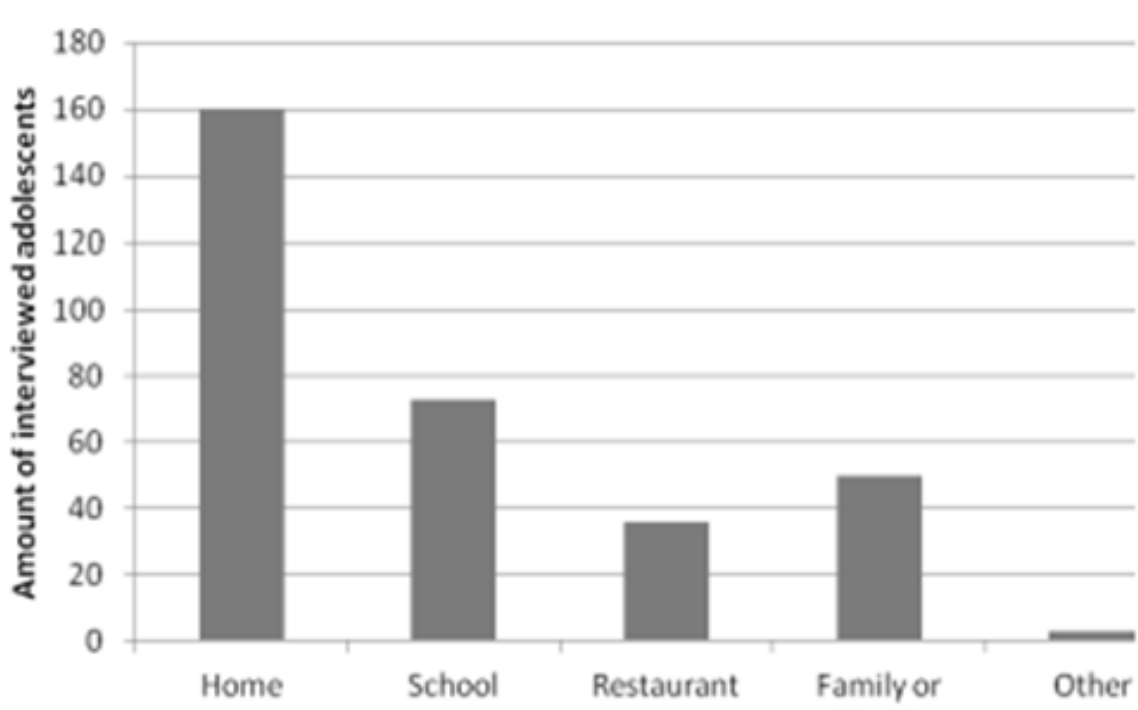
* Significant difference on p<0.05

Paired comparison

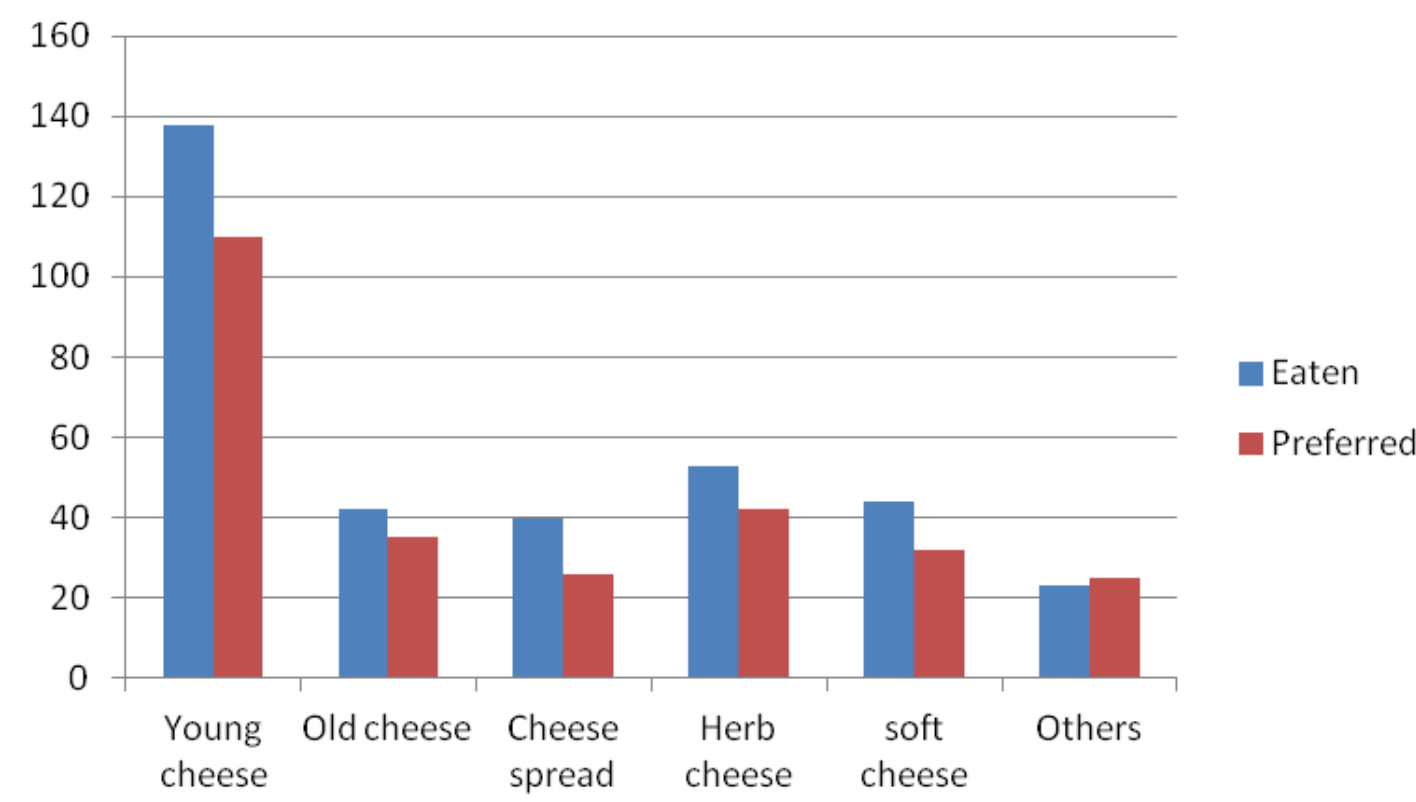
	Correct answers	Correct answers in %
Salt	12	54,55
Fat	15	68,18
Nutty (umami)	15	68,18

CONSUMER SENSORY TEST

Place of cheese consumption (n=220)



Cheese eaten and preferred by respondents (n=220)



Preferences of six cheeses

Preferences of cheeses (low or high salt, umami or fat content) by adolescents (11-14 years old)								
Salt preference			Fat preference			Umami preference		
Nazareth Light	Nazareth Classic		Dixmuda	Belgolight		Brugge belegen	Brugge jong	
230	847	Total	145	619	Total	362	951	Total
73*	107*	180	94	88	182	87	99	186

The difference of the preferences of cheese (lower or higher salt, umami or fat content) by adolescents (11-14 years old) with a different nutritional knowledge								
Salt preference			Fat preference			Umami preference		
Cheese	Nazareth Light	Nazareth Classic	Dixmuda	Belgolight		Brugge belegen	Brugge jong	
N*	230	847	Total	145	619	Total	362	951
100-75%	2	3	5	2	3	5	2	3
75-50%	20	27	47	24	20	44	18	26
50-25%	37	55	92	49	43	92	48	49
25-0%	10	16	26	17	13	30	15	13
Total	69*	101*	170	92	79	171	83	91
X ² p-value	0,988			0,918			0,695	

The difference of the preferences of cheese (lower or higher salt, umami or fat content) of adolescents (11-14 years old) by men and women								
Salt preference			Fat preference			Umami preference		
Cheese	Nazareth Light	Nazareth Classic	Dixmuda	Belgolight		Brugge belegen	Brugge jong	
N*	230	847	Total	145	619	Total	362	951
Boys	42*	68*	110	58	47	105	54	54
Girls	29	38	67	33	38	71	31	42
Total	71*	106*	177	91	85	176	85	96
X ² p-value	0,502			0,254			0,319	

The difference of the preferences of cheese (lower or higher salt, umami or fat content) by adolescents (11-14 years old) when they have a different habitat								
Salt preference			Fat preference			Umami preference		
Cheese	Nazareth Light	Nazareth Classic	Dixmuda	Belgolight		Brugge belegen	Brugge jong	
N*	230	847	Total	145	619	Total	362	951
Countryside	25*	44*	69	33	33	66	35	33
City	43	61	104	54	51	105	48	60
Total	68*	105*	173	87	84	171	83	93
X ² p-value	0,500			0,856			0,363	

The difference of the preferences of cheese (lower or higher salt, umami or fat content) by adolescents (11-14 years old) when they live in a different province								
Salt preference			Fat preference			Umami preference		
Cheese	Nazareth Light	Nazareth Classic	Dixmuda	Belgolight		Brugge belegen	Brugge jong	
N*	230	847	Total	145	619	Total	362	951
West Flanders	11*	26*	37	16	18	34	15	20
East Flanders	28	37	65	32	32	64	29	41
Limburg	28	41	69	38	34	72	37	33
Total	67*	104*	171	86	84	170	81	94
X ² p-value	0,395			0,854			0,360	

The difference of the preferences of cheese (lower or higher salt, umami or fat content) by adolescents (11-14 years old) when they have a different school type								
Salt preference			Fat preference			Umami preference		
Cheese	Nazareth Light	Nazareth Classic	Dixmuda	Belgolight		Brugge belegen	Brugge jong	
N*	230	847	Total	145	619	Total	362	951
ASO	47*	75*	122	58	62	120	58	67
TSO	17	26	43	29	16	45	24	20
Total	64*	101*	165	87	78	165	82	87
X ² p-value	0,907			0,065			0,352	

* Significant difference on p<0.05

Conclusions

For the discriminative tests, only the duo-trio test of the Belgolight and Dixmuda duo showed a significant difference.

The consumer test indicates that there is a higher preference for cheeses with a high salt content. This effect is also related with socio-demographic factors: gender, habitat, province and education level. Adolescents did not have a clear preference regarding cheeses with low/high umami and low/high fat content. Nutritional knowledge did not affect taste preference of the adolescents. The hypothesis that adolescents with a high nutritional knowledge would prefer a more healthy cheese, was rejected.

Overall, it can be concluded that Belgian adolescents prefer cheeses with a higher salt level. This effect was significant for some socio-demographic factors but not related to nutritional knowledge. Future research can focus on other consumer segments to gain insight in the cheese preference of Belgian consumers and thus help cheese producers in the production of an ideal product.

Sichert-Hellert W, Beghin L, De Henauw S, Grammatikaki E, Hallström L, Manios Y, Mesana M, Molnár D, Dietrich S, Piccinelli R, Plada M, Sjöström M, Moreno LA, Kersting M; HELENA Study Group. 2011. Nutritional knowledge in European adolescents: results from the HELENA (Healthy Lifestyle in Europe by Nutrition in Adolescence) study. Public health nutrition 14 (12), 2083-2091.