Hot cognition in agricultural policy preferences in Norway?

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Abstract The paper tests the hypothesis that cultural and social background is far more influential to form preferences about policy than the level of fact-based knowledge a person possesses. The data for the case study stem from a web-based survey among a representative sample of the adult population in Norway. The degree of knowledge of agriculture in this paper is operationalized through questions on five key characteristics of Norwegian agriculture that frequently arise in the public discussion. The results show that the amount of fact-based knowledge of agriculture to a very little extent explains differences within the sample. The cultural background of respondents is much more suited to explain agricultural policy preferences. Knowledge, however, shifts the attention from food price issues towards the delivery of public goods. The results allow us to hint at hot cognition as a possible explanation for such findings.

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Introduction

Does fact-based knowledge of agriculture or do socio-cultural factors matter more in influencing citizen preferences for specific agricultural policies? Cognitive sciences have developed rapidly in recent decades and provided increasingly helpful approaches in explaining attitudes. Several scholars (Somech and Bogler 1999; Englich 2008; Smith, Windschitl and Bruchmann 2013) emphasize the importance of knowledge in preference formation. The concept of "hot cognition" has become a counterweight to this approach. This concept supposes that "moral reasoning is usually a post hoc construction, generated after a judgment has been reached" (Haidt 2001, p. 814), so that "all social information processing is affectively charged and prone to biases" (Redlawsk 2002, 1021). The "primacy of affect" (Lavine 1998) has been physiologically explained (Morris et al. 2003) and empirically verified in the realm of politics (Lodge and Taber 2005; Burdein, Lodge and Taber 2006; Plischke, Rattinger and Wagner 2013). Social psychologists have repeatedly demonstrated the power of spontaneous, affective measures on attitude formation (Barsky, Kaplan and Beal 2011; Leschziner and Green 2013; Sophie Russel and Giner-Sorolla 2013). In policy issues, however, the hot cognition hypothesis has enjoyed much less attention. A notable exception from a theoretical standpoint is French (2014, p. 29), emphasizing that "much judgment occurs spontaneously and very rapidly, that it is involuntary and non-semantic and that it depends upon the emotional impact of experience rather than conscious weighing of situations against explicit standards of assessment such as science, self-interest or moral theory."

A direct and explicit test of the hot cognition hypothesis through a survey creates considerable methodological problems (Casebeer 2003). Instead, we approach the hot cognition hypothesis indirectly using an online survey about citizens' preferences for agricultural policy to test an alternative hypothesis, namely that cultural and social background is far more influential to form preferences about policy than the level of fact-based knowledge a person possesses. Confirming the latter hypothesis would allow us to hint at hot cognition as a possible explanation for such findings. Our case in point is Norwegian agricultural policy. Norway is among the countries with the highest level of government intervention (OECD 2013), causing a lot of debate about the effectiveness and efficiency of this high degree of public involvement in farming (Greer 2005; Buysse, Huylenbroeck and Lauwers 2007; Bjørkhaug and Richards 2008).

The paper starts by summing up the current state of knowledge about agricultural policy preferences. It then introduces a theoretical framework transferring the hot cognition hypothesis to the realm of agricultural policy, followed by a description of the method and the characteristics of the data. Results are presented and discussed whereupon final conclusions are drawn.

Preferences on agricultural policy

Agriculture is a sector in which many governments interfere strongly causing significant costs to citizens as both consumers and taxpayers. Information on what the public wants from agriculture and agricultural policies is therefore deemed necessary in many ways. Firstly, such information is important in the assessment of the level of government spending for such policies (Schokkaert 1987). Secondly, such information is required to better target agricultural policies towards society's requirements regarding agriculture. Thirdly, information on the structure and causes of citizens' preferences for agricultural policies can be valuable for the understanding how preferences may change over time due to population development and other changes in society (Variyam, Jordan and Epperson 1990). In spite of that, the literature on measuring the preferences of citizens for broad scale agricultural policies is sparse. Valuable exemptions include Variyam et al. (1990) and Ellison, Lusk and Briggeman (2010). The literature has focused on selected aspects of agricultural policies such as organic food (Skorstad and Bjørkhaug 2003, McEachern and Willock 2004), environmentally friendly food (Selfa, Jussaume and Winter 2008), genetic modified organism (GMO) (James and Burton 2003), attributes of agricultural sustainability (Sydorovych and Wossink 2008; Hermans et al. 2010; Yrjölä and Kola 2004), and landscape amenities summarized in the review of Hall, McVittie and Moran (2004).

Although the literature has identified a significant willingness to pay (WTP) for certain attributes, less focus has been placed on the understanding of what causes the shaping of preferences for agricultural policies. For instance, Bennett, Anderson and Blaney (2002) and Hyytia and Kola (2005) compare the willingness to pay (WTP) for certain attributes with respondents' attitudes. They obtain slightly contradicting results: While, in the case of animal welfare, a relation between moral intensity and WTP can be detected, a positive attitude towards

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multifunctionality is not related to the level of WTP. This ambiguity questions the rationality of stated preferences and raises the need to look behind their reality. Potter and Tilzey (2005) argue that multifunctionality, neomercantilism and neoliberalism are competing paradigms in agricultural policy. Which of them dominates in the European context could be observed when the German government in 2000 switched from a production-oriented to an environment-oriented agricultural policy ("Agrarwende"). Mann and Mante (2003) show that this move found broad support among German citizens. On the other hand, there are currently no mechanisms in place in the policy process to adapt policies to the order of importance which citizens attach to the different possible attributes of a multifunctional agriculture (Gómez-Limón and Atance, 2004).

While some scholars have gone as far as to explain preferences for agricultural policy by their socioeconomic characteristics (Kallas, Gómez-Limón and Arriaza 2007), the link from agricultural policy opinion research to the science of preference formation has yet to be made. It is still unclear which underlying factors shape preferences on how governments should deal with the primary sector.

This study makes an attempt to fill this gap by focusing on the influence of knowledge about agriculture on the shaping of preferences for agricultural policies. For that purpose, we divide knowledge into (1) fact-based knowledge that is frequently discussed in the public debate such as a portrayal of the number of farms, farm income and the food bill, and (2) knowledge derived from the respondents' social and cultural background.

Theoretical framework

In environmental economics, the literature on preference revelation commonly makes the point that a-priori information needs to be given to respondents in order to yield useful results (Ajzen, Brown and Rosenthal 1996; Munro and Hanley 2001; Berrens et al. 2004). The cited authors have shown that people can hardly form 'reasonable' preferences in terms of willingness-to-pay for an environmental amenity without a-priori information. In contrast, psychological studies as cited in the previous section indicate that political opinions are formed much more on the base of affects than on the base of information. Can this apparent contradiction be solved?

It should be taken into account that the empirical fields in which both schools have verified their approach have differed from each other. The impact of knowledge has been verified when respondents had the task to find reasonable monetary values for a public good. Values have a strong comparative dimension, and realistic comparisons should be based on some cognitive understanding on what exactly has to be compared. The hot cognition hypothesis, however, has usually been applied in the evaluation of politicians, where personal, subjective factors appear to play a stronger role.

In order to judge agricultural policy appropriately, it is useful to be well informed about farm economics, the benefits of insects or the nitrogen circle. However, we contend that these are unlikely to be the decisive factors forming support or opposition towards governmental involvement in agriculture. Rather, we expect the level of sympathy with and cultural proximity to the farming community to play a more influential role than the level of fact-based knowledge. Therefore, our hypothesis is that knowledge about agriculture derived from social and cultural background has a more significant effect on the formation of preferences for agriculture and agricultural policies than fact-based knowledge. We investigate that claim by adding questions at the end of the questionnaire that deal with some fundamental key characteristics about agriculture in Norway that frequently enter the media. From these questions we create a fact-based knowledge variable that enters the regression models as an explanatory variable.

The respective mental model how preferences are formed over time is depicted in Figure 1. It is the cultural influences which are decisive in forming preferences about agricultural policy, for example a family formed by farmers. The preference is not changed qualitatively through additionally generated knowledge, even though the preference can now be better defended against other positions and, more importantly, the details of the preference structure are now more prone to fact-based knowledge.

<< Figure 1 inn here >>

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Methods and data

The data used in the analysis were collected through a web-based questionnaire by *Response Analyse*, a professional poll Institute located in Oslo. The questionnaire was sent to the Institute's own panel of respondents in late November 2013 until 1,005 valid answers were received. *Response Analyse* guarantees that the sample is representative for the Norwegian adult population.

We approached the respondents primarily in their role as citizens rather than as consumers, taxpayers or voters (Sagoff 1998; Vatn 2009). In particular, the questions about the agricultural policy issues were introduced with the formulation "*In my opinion society should give more priority to...*" instead of "*I would give more priority to...*". By doing so, we acknowledge that individuals may have different preferences when acting as citizens compared to when acting in other roles. Since we approached citizens, the degree of technicality was kept at a relatively low level (Frewer et al. 2005).

We chose two approaches to reveal preferences. In the first approach, respondents were asked to mark on a scale from 1 to 6 to which extent they agreed with a given agricultural policy issue. The questionnaire contained twenty-one issues (table 1) that were chosen based on political documents and statements that frequently appear in print and other media. This first approach showed the general sympathy respondents showed towards governmental involvement in agriculture.

<< Table 1 inn here >>

In a second approach, respondents were asked to allocate 100 points to the following seven general agricultural policies issues: (1) food self-sufficiency (*self*), (2) food prices (*pric*), (3) diversity of food choices (*fodi*), (4) rural settlement (*ruse*), (5) farm income (*inco*), (6) protection of agricultural area (*prot*), and (7) preservation of agricultural landscape (*culd*). The questionnaire did not specify whether to increase, decrease or maintain the current level associated with the specific issues. Rather we were interested to detect the influence of knowledge on the issues in agricultural policy perceived as important.

<< Table 2 inn here >>

Table 2 illustrates the different background variables. General variables include among others sex, education, household size and household income. Some background questions were devoted to identify the respondent's social and cultural background. We assumed that, for example, growing up on a farm or even only in a rural environment would shape emotions and ties towards agriculture, acting as a proxy for the first step depicted in Figure 1. Finally, five questions on knowledge about agriculture were designed to estimate the effect of fact-based knowledge on preferences for agricultural policy, assuming that fact-based knowledge may form cognitive beliefs which in turn are then responsible for preference formation. The respondents were asked about the number of farmers, the share of agricultural area of total land area, the share of income spent on food purchases, the level of budget support to agriculture and the share of consumed food which is produced in Norway. These figures are commonly published in the media and frequently used by the farmers' organizations in their endeavor for continuous public support of and goodwill for the Norwegian agricultural sector. They represent some very basic facts about Norwegian agriculture, making them appropriate as a proxy for fact-based knowledge. We believe that a respondent with an average interest in the public policy discussion regarding agriculture should be able to answer at least some of these questions with some accuracy.

The respondents' knowledge on agriculture was operationalized by first calculating for each question the absolute difference between the respondents' own answer and the correct answer. In a second step, the respondents were divided into six groups of equal size according to the absolute difference calculated above. Respondents in the group with the smallest (largest) difference got six (one) point(s). Respondents in the other groups were allocated points accordingly. Finally, the total score for each respondent was calculated by simply adding the points for each of the five questions. Hence, the minimum (maximum) total score was 5 (30) points. The variable was labeled *know* and its distribution is shown in figure 2.

<< Figure 2 inn here >>

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The method was chosen in order to classify respondents mutually. That is, we were not interested in the respondents' absolute level of knowledge, but rather how respondents performed compared to each other.[1]

Finally, in addition to the fact-based knowledge variable, all variables measuring general background as well as social and cultural background were included in ordinary regression models with each of the twenty-one agricultural policy issues as the dependent variable.

Results

Table 3 presents the main results to answer our basic research question: Does knowledge of agriculture or do socio-cultural factors matter more in influencing citizen preferences for specific agricultural policies? The variables in table 3 are ordered according to the number of times they became significant in the twenty-one regressions used in the first approach[2]. The variable measuring fact-based knowledge is only placed at rank eight out of fourteen. The two most important variables in this respect are the two socio-cultural variables *prefer_Norw_food* and *ag_policy_interest*. *Sex* and *education* are the most significant variables among the general background variables. The two variables characterizing the household (*household_size* and *household_income*), the number of purchases at a farm or a farmer's market (*farm_purchase*) and the post code as a proxy for regional differences (*post_code*) were least significant indicating that there is little variation across households and regions regarding preferences for agricultural policies.

<< Table 3 inn here >>

Variation in sex, preferences for Norwegian food above imported food, special concerns in agriculture and agricultural policy, whether one knows many farmers, education, and whether one is raised on a farm contribute most to the explanation of the variance in the preferences for

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[1] An attempt was made where the variable was constructed on the basis of absolute knowledge. This variable did not enhance the explanatory power of the econometric regression compared to the construction of the variable using relative knowledge.
[2] The regression results according to the first approach are shown in table A.1 of the appendix.

the twenty-one policy issues. Women's preferences for agricultural policy issues are more in favor of farmers that men's preferences. The same holds true for those that have special concerns in agricultural and agricultural policy and those that prefer to buy Norwegian food above imported food. They prefer issues in favor of agriculture and oppose the removal of import tariffs for cheese, the preservation of a sustainable predator tribe, the reduction of food prices to Swedish levels, the removal of the duty to live on the farm, and the reduction of agricultural subsidies.

Education works in a different direction. Those with a high level of education tend to oppose 'to maintain open cultural landscapes', 'to maintain food self-sufficiency at current levels', 'to maintain rural settlement', 'to ensure farm income at comparable levels', and 'to maintain largest possible number of farms', but they also oppose 'to reduce food prices to Swedish levels'.

The explanatory variables 'raised on a farm' and 'knows many farmers' rank with regard of their explanatory power after the ones mentioned above. The variable 'knowledge' ranks number eight out of the fourteen explanatory variables. The variable is not significant for those policy issues that are ranked highest. If significant, respondents with a better knowledge are ambiguous with respect to policy issues. They oppose the maintenance of the largest possible number of farms, but they also oppose the reduction of food prices to Swedish levels.

Explanatory variables like respondent's age, county of living, the numbers of inhabitants at the place the respondent spent his/her childhood, whether one buys food at the farm or at farmer's market, the number of persons in the respondent's household, and the respondent's household income contribute very little to explain variances in data.

The order of the importance of the explanatory variables to explain variances in the results is slightly different compared to the first approach. The same variables still rank highest, but their order is different. Whether one knows many farmers ranks highest, followed by preferences for Norwegian food above imported food, cross-border food trade, special concerns for agriculture and agricultural policy, sex, and whether one is raised on a farm. Education, knowledge, age, food purchases on a farm or farmer's markets, and household income rank in the middle, while the county of living, the number of inhabitants of the place the respondent spent his/her childhood and the number of persons in the respondent's household are of minor importance.

The results of the second approach are shown in the Appendix table A.2 and indicate that respondents give most attention to food prices, followed by food self-sufficiency, farm income, rural settlement, and the diversification in food products. Cultural landscape and soil conservation rank lowest. Combined with the first block of results, this indicates that there is broad support for maintaining cultural landscapes, but it is not seen as a really burning issue.

<< Table 4 inn here >>

In order to investigate possible relationships between the variable 'knowledge' and the socio-cultural factors, a regression was run with 'knowledge' as the dependent variable and the socio-cultural factors as well as background variables as independent variables. Results are shown in table 4. It turns out that several variables contribute significantly to the explanation of variances in the level of knowledge such as sex, education, specific concern with agriculture and agricultural policies, region, and the propensity for cross border food trade. Women possess significantly better knowledge than men, and, not surprisingly, higher educated people have more knowledge than less educated people. People that conduct less cross border trade are more informed about agriculture. Also, people in the Southern part of Norway possess more knowledge compared to people in the North (*post_code*). Moreover, the level of knowledge increases with age and if one has personal relations to a farmer (*know_farmers*). The level of knowledge decreases if one buys at a farm or a farmer's market (*farm_purchase*). We can conclude that the level of knowledge on agriculture does not seem to depend on personal relationships with people from the farm sector, but rather on personal interests including the level of education.

Discussion and conclusion

While many authors have already measured preferences on agricultural policy, the influence of cultural predispositions has not been compared yet with the influence of knowledge. The competition among social psychologists to prove the dominance of the one or the other, however, warrants such an attempt.

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Knowledge is important. Cognition starts to play a role when allocating the attributes important in agricultural policy. It becomes clear that cognition is needed to appreciate the importance of the public goods delivered by farmers like landscape and sustainable soil conservation. This is certainly a point for environmental economists emphasizing the value of information in their surveys. Knowledge also helps to acknowledge the importance of low food prices for consumers' utility. One could even go as far as interpreting the avoidance of farmer markets by well-informed people as an indicator for the low added-value which farmer markets generate compared to their higher prices.

Altogether, the analysis shows that fact-based knowledge about agriculture does seem not to have a significant effect on the formation of society's preferences for agriculture and agricultural policies. Issues that matter are rooted in the respondent's cultural background, such as social proximity to farmers, coming from a farm or a preference for Norwegian food. The significant influence of education indicates that it very much serves as a background variable for the cultural background of a person and not only as a background variable for knowledge, even though education contributes to the explanation of knowledge to a significant degree. Urban residents, far from any connection with agriculture, tend to have higher education levels than rural residents – and support much less that agriculture is subsidized by the government.

Our analysis did not test the hot cognition hypothesis with regard to agricultural policies directly. The question mark in the title of the paper remains. However, the fact that fact-based knowledge does not seem to play a major role in preference formation may hint to the interpretation that hot cognition very well may play a role in such respect. This argument is reinforced by the rather loose social and cultural connection the respondents seem to have to the farming community illustrated by the variables 'preferences for Norwegian food' and 'agricultural policy interests'. We hypothesize that this loose connection makes it easier to form preferences rather spontaneously and rapidly.

Further improvements could include the development of an appropriate method to analyze the hot cognition hypothesis, a factor analysis to identify patterns in the data, both with respect to explanatory variables, but also with respect to policy issues. In addition, experiments in which a (positive or negative) affect towards agriculture is generated could provide additional insights into the valence of the hot cognition approach.

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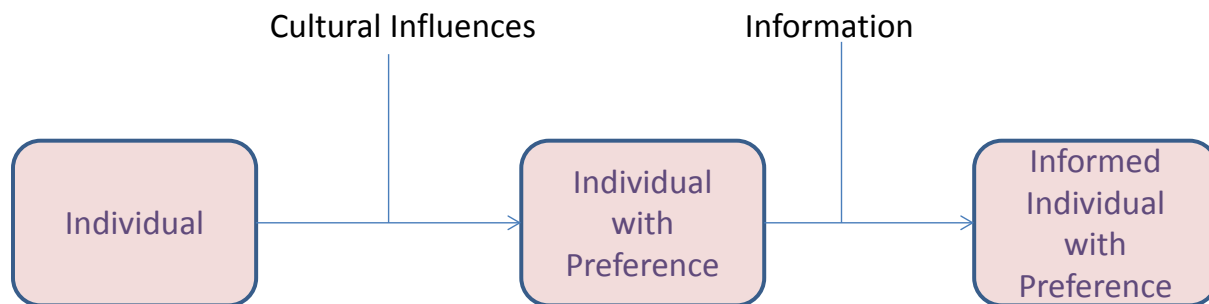
Figure 1: Explanatory model for agricultural policy preferences
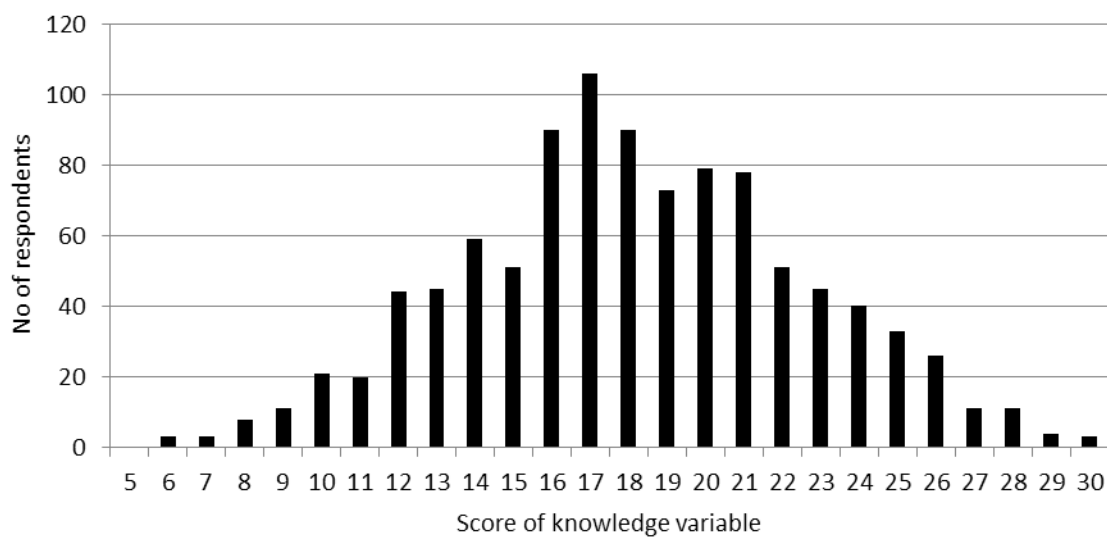
Figure 2. Distribution of constructed knowledge variable (know)

Table 1. Agricultural policy issues in the questionnaire

In my opinion society should give more priority to…	Variable name
ensure that income from farming is in line with the income of other groups in society	*ag_income*
ensure safe food	*safe_food*
maintain food self-sufficiency at current levels	*self_sufficiency*
contribute to a healthy diet	*healthy_diet*
maintain an open cultural landscape	*landscape*
protect agricultural area from being diverted	*soil_protection*
require animals to graze	*animal_grazing*
implement higher standards for animal welfare	*animal_welfare*
implement stricter environmental regulations	*environ_regulation*
maintain rural settlement	*rural_settlement*
preserve cultural heritage (e.g., old farm buildings, food traditions)	*cult_heritage*
stimulate alternative on-farm income opportunities	*alternative_income*
foster the use of genetic modified organism in agriculture	*use_of_GMO*
maintain as many farms as possible	*no_of_farms*
reduce food prices to the same level as in Sweden	*food_prices*
require better food labeling	*food_labeling*
reduce greenhouse gas emissions from agriculture	*GHG_emissions*
remove duty to live on the farm	*duty_live_on_farmt*
reduce budget support to agriculture	*budget_support*
secure a viable amount of predators	*predators*
remove import tariff on cheese	*cheese_tariff*

Table 2. Background variables

Question	Scale	Name
General background		
What is your sex?	1 = Male, 2 = Female	*sex*
What is your year of birth?	Four digits	*age*
What is your post code?	Four digits	*pcod*
What is your highest level of education?	1 = Primary level 2 = Secondary level 3 = College/University (1-4 years) 4 = University (> 4 years) 5 = No answer	*educ*
How many persons live in the household (you included)?	1 = 1 person 2 = 2 persons 3 = 3 persons 4 = 4 persons 5 = 5 persons or more	*hper*
What is the household's gross annual income?	1 = < 200 000 nkr 2 = 200 000 – 399 999 nkr 3 = 400 000 – 599 999 nkr 4 = 600 000 – 799 999 nkr 5 = 800 000 – 1 000 000 nkr 6 = > 1 000 000 nkr 7 = No answer	*hinc*
Social and cultural background		
What was the number of residents at the place you were raised?	1 = < 200 2 = 200 – 999 3 = 1 000 – 1 999 4 = 2 000 – 19 999 5 = 20 000 – 99 999 6 = > 100 000	*plac*
I have a particular interest in agricultural policy	1 = Yes, 0 = No	*intr*
I regularly purchase food directly at a farm or at a farmers' market	1 = Yes, 0 = No	*pufa*
I'm raised at a farm	1 = Yes, 0 = No	*rafa*
I know many who work as farmers	1 = Yes, 0 = No	*knfa*
I prefer to purchase Norwegian food rather than imported food	1 = Yes, 0 = No	*prno*
How often do you make purchases in Sweden, Denmark or Finland	1 = > 1 times per month 2 = 1 time per month 3 = < 1 times per month 4 = Never	*fdtr*
Fact-based knowledge		
What do you think is the number of farmers in Norway?	Number	*nfar*
What do you think is the share of	Per cent	*saga*

agricultural area in Norway?		
What do you think is the share of our income we spend on food?	Per cent	*sinc*
What do you think is the level of budget support to agriculture?	Bill nkr	*supp*
How much of the food we eat do you think is produced in Norway?	Per cent	*sfod*
Derived knowledge from the five questions above	Integer between 5 and 30	*know*

Table 3. Importance of background variables for the twenty-one preferences for agricultural policies

Rank	Independent variable	Level of significance			
		0.99%	0.95%	0.90%	Sum
0	constant	21			21
1	prefer_Norw_food	15	2		17
2	ag_policy_interest	11	2	3	16
3	sex	14	1		15
4	education	6	3	6	15
5	know_farmers	3	5	3	11
6	size_place_raised	4	3	3	10
7	cross_border_food_trade	5	4		9
8	knowledge	3	2	1	6
9	age	2	4		6
10	farm_raised		2	2	4
11	post_code	1		2	3
12	household_size	2			2
13	farm_purchase		1	1	2
14	household_income		1		1

For "Level of significance," the numbers in columns indicate the number of times the variable's coefficients were significant in the 21 regressions at the 0.99 %, 0.95 %, and 0.90 % significance level.

Table 4. Regression results explaining level of fact-based knowledge

	Coefficient
R^2	0.15
N	870
constant	16.23***
age	0.02*
ag_policy_interest	1.25*
farm_raised	0.37
know_farmers	0.56*
prefer_Norw_food	0.47
farm_purchase	-0.71*
post_code	-0.08***
Education	0.68***
size_place_raised	-0.03
household_size	0.08
cross_border_food_trade	0.64***
household income	0.10
sex	-2.40***

Significance level: *** 0.99%, ** 0.95%, and * 0.90%

Appendix table A.1. Regression results of first approach

	safe_food	healthy_diet	animal_welfare	animal_grazing	landscape	self_sufficiency	rural_ settlement
R^2	0.11	0.12	0.10	0.14	0.17	0.21	0.22
N	850	852	842	840	822	832	835
constant	4.51***	3.63***	3.98***	3.59***	2.83***	3.52***	3.39***
age	0.00	0.01**	0.00	0.00	0.01***	0.00	0.01**
ag_policy_ Interest	0.30***	0.27***	0.03	0.31***	0.49***	0.45***	0.42***
farm_raised	0.16	0.20*	0.13	0.10	0.16	0.20	0.14
know_farmer s	0.07	0.07	0.21**	0.30***	0.21**	0.30***	0.39***
prefer_Norw _ Food	0.39***	0.33***	0.35***	0.35***	0.26***	0.51***	0.55***
farm_purchas e	0.06	-0.02	0.17	0.17*	0.31***	-0.13	-0.03
post_code	0.01	0.01	0.00	0.02*	0.02*	0.01	0.03***
education	-0.05	-0.08	-0.09*	-0.05	-0.12**	-0.21***	-0.23***
size_place_ raised	0.01	-0.01	0.06**	0.02	-0.03	-0.03	-0.02
household_ Size	0.03	0.04	-0.03	0.01	0.03	0.05	0.00
cross_border _ food_trade	0.01	0.04	-0.08	-0.07	0.15**	0.13*	0.09
knowledge	0	-0.01	-0.01	-0.01	0.00	0.00	-0.01
household_ Income	-0.02	0.00	0.06*	0.03	0.05	-0.03	-0.04
sex	0.31***	0.57***	0.55***	0.62***	0.50***	0.64***	0.63***

Appendix table A.1. Regression results of first approach (cont.)

	alternative_ income	cult_heritage	food_labeling	soil_protection	ag_income	environ_regulati on	cheese_tariff
R^2	0.04	0.10	0.09	0.21	0.24	0.08	0.23
N	810	843	841	832	829	830	763
constant	4.64***	3.3***	4.62***	2.66***	3.85***	2.85***	6.55***
age	0.01***	0.00	0.01***	0.01*	0.00	0.01*	0.01*
ag_policy_ interest	-0.15	0.25**	0.10	0.59***	0.65***	-0.04	-1.18***
farm_raised	0.14	0.02	0.05	0.31**	0.29**	0.08	-0.08
know_farmer s	0.26***	0.25**	-0.14	0.28***	0.37***	0.06	-0.19
prefer_Norw _ food	0.03	0.42***	0.25***	0.45***	0.46***	0.33***	-0.70***
farm_purchas e	0.13	0.1	0.21*	0.09	0.02	-0.01	0.24
post_code	0.00	0.02*	0.01	0.01	0.02*	-0.01	0.00
education	-0.07	-0.1*	-0.11**	-0.11**	-0.21***	0.06	-0.06
size_place_ raised	0.07**	0.00	0.05	-0.03	-0.05	0.07*	0.06
household_ size	0.02	-0.01	-0.04	0.03	0.01	-0.06	0.04
cross_border _ food_trade	-0.16**	-0.02	-0.12*	0.23***	0.13*	-0.03	-0.45***
knowledge	-0.01	0.01	-0.03***	0.00	-0.01	0.00	-0.03**
household_ income	0.01	0.03	0.02	-0.03	-0.01	0.03	0.01
sex	-0.05	0.52***	0.36***	0.61***	0.51***	0.57***	-0.07

Appendix table A.1. Regression results of first approach (cont.)

	GHG-emissions	no_of_farms	food_prices	predators	duty_live_on_farm	use_of_GMO	budget_support
R^2	0.08	0.26	0.24	0.10	0.09	0.08	0.24
N	810	841	830	811	779	746	779
constant	3.22***	3.58***	6.61***	5.84***	5.22***	4.59***	5.64***
age	0.01***	0	0.02***	-0.03***	0.01*	0	0.01**
ag_policy_interest	-0.17	0.72***	-0.54***	-0.41***	-0.56***	-0.43***	-0.90***
farm_raised	0.05	0.16	-0.06	-0.13	-0.04	0.10	0.02
know_farmers	0.00	0.23**	-0.14	-0.32**	-0.04	0.17	-0.23*
prefer_Norw_food	0.23**	0.49***	-0.44***	-0.02	-0.32**	-0.12	-0.69***
farm_purchase	-0.03	0.00	-0.03	0.21	0.02	-0.05	0.03
post_code	-0.01	0.01	0.01	-0.01	0	0.02	-0.01
education	0.08	-0.29***	-0.26***	0.07	-0.08	-0.22***	0.07
size_place_raised	0.05	0.02	0.12***	0.08*	0.02	0.05	0.05
household_size	-0.06	0.03	0.18***	-0.21***	0.09	-0.07	-0.02
cross_border_food_trade	-0.15**	0.19**	-0.62***	-0.17*	-0.29***	-0.25***	-0.38***
knowledge	-0.01	-0.03***	-0.06***	0.00	-0.03*	-0.01	-0.03**
household_income	-0.02	-0.14***	-0.14***	0.08	0.05	0.01	0.01
sex	0.55***	0.68***	-0.09	-0.11	-0.34***	-0.36***	-0.50***

Appendix Table A.2. Regression results of second approach

	Rural settlement	Ag_income	Soil_protection	Landscape	Food_prices	Self_sufficiency	Food_choices
R^2	0.21	0.06	0.17	0.1119	0.12	0.03	0.08
N	870	870	870	870	870	870	870
constant	5.34	2.21	1.28	3.34	55.07***	8.40*	24.37***
age	0.04	-0.01	0.01	0	0.07**	-0.04	-0.08***
ag_policy_ interest	1.16	4.17***	2.04***	-0.19	-4.39***	1.84	-4.62***
farm_raised	-1.27	5.59***	0.79	-0.23	-2.76*	-0.48	-1.65
know_farmers	4.62***	3.61***	0.00	-0.77	-3.70***	-0.71	-3.04***
prefer_Norw_ food	0.58	2.24***	-0.05	0.24	-6.45***	4.86***	-1.42
farm_purchase	-1.76*	0.20	0.76	2.03**	-0.05	-3.31***	2.12**
post_code	0.24***	0.13	-0.19***	0.00	-0.08	0.07	-0.17*
education	-0.31	-0.18	-0.28	0.81**	-1.44**	1.08**	0.32
size_place_ raised	-0.65**	-0.12	0.12	-0.04	0.29	-0.27	0.66**
household_ size	-0.35	-0.18	-0.12	-0.34	1.36**	-0.02	-0.34
cross_border_ food_trade	1.41**	1.69***	1.13**	0.53	-5.72***	1.76**	-0.80
knowledge	0.04	0.01	0.33***	0.16**	-0.44***	-0.01	-0.09
household_ income	-0.19	0.18	-0.41*	0.43*	-0.78*	0.04	0.72**
sex	2.54***	2.07**	0.89	0.08	-3.09***	-0.42	-2.07**