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OF ECONOMICS  
AND BUSINESS



# Food insecurity among small scale farmers - case of Poland

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# Introduction

- Food insecurity means a situation in which “*people do not have adequate physical, social or economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life*” [FAO 2010, p.8.]
- The problem of deficiency of food security is global and is most noticeable and harmful at the household level, also in the developed countries.
- The households at risk of food insecurity were indicated in such countries as the U.S., Canada, Australia, New Zealand, France, Spain, UK, Portugal or Germany.

# Introduction

- Research focuses on socially vulnerable groups such as children, older, women, minority ethnic groups or homeless.

Some numbers from papers:

- In Nordic countries, over 37% of Finnish, 28% of Norwegian, 29% of Danish and almost 28% of Swedish respondents declared having experienced food insecurity. Of these, a lower number of reported persons did not have enough food to eat (4%, 1.5%, 1.7% and 1.9% in Finland, Norway, Denmark and Sweden, respectively). Over 41% of respondents in Hungary, 28% in Estonia, 26% in Slovakia, 21% in Greece and 20% in Poland were exposed to food insecurity.

# Introduction

- In Poland the problem of food insecurity is rather neglected in scientific research, especially at the household level.
  - According to UNICEF research in 2014–2015 in Poland, about 9.6% of households were moderately food insecure, almost 2% severely food insecure and more than 17% reported not having enough money.
  - In 2017, 6.3% of the Polish population could not afford a meal with meat, chicken, fish (or vegetarian equivalent) every second day [Dudek 2019].
- Farmers play an important role in ensuring food security, they are also exposed to food insecurity at the household level. There is a rich body of literature devoted to the problem of food insecurity among small-scale farmers in developing countries.
- What about the developed countries with fragmented agrarian structure?

# Introduction

- **Main goal:** to identify the prevalence and determinants of food insecurity among small-scale farms in Poland
- *“from the global and the national to the household and the individual; from a food first perspective to a livelihood perspective”* [Maxwell, S., 1996, p. 155]

# Material and methods

- Data: primary survey; 710 questionnaires distributed among small-scale farmers in January-March 2018 in Poland
  - economic size: 4000-15 000 EUR of SO;
  - agriculture as main economic activity: min. 75% of AWU working on farm
- HFIAS indicator: experience-based food insecurity scale based on Household Food Insecurity Access Scale:
  - HFIAS category
  - HFIAS score

# HFIAS standard questions

## I. Anxiety and uncertainty about the household food supply:

1. Did you worry that your household would not have enough food?

## II. Insufficient quality (included variety and preferences of the type of food):

2. Were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?

3. Did you or any household member have to eat a limited variety of foods due to lack of resources?

4. Did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?

## III. Insufficient food intake and its physical consequences:

5. Did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?

6. Did you or any household member have to eat fewer meals in a day because there was not enough food?

7. Was there ever no food to eat of any kind in your household because of a lack of resources to get food?

8. Did you or any household members go to sleep at night hungry because there was not enough food?

9. Did you or any household member go a whole day and night without eating anything because there was not enough food?

# HFIAS methodology

- how often did this happen?

0 = Never

1 = Rarely (once or twice in the past four weeks)

2 = Sometimes (three to ten times in the past four weeks)

3 = Often (more than ten times in the past four weeks)

	Frequency question	Frequency		
		Rarely	Sometimes	Often
	1a			
Food secure	2a			
	3a			
Mildly food insecure	4a			
	5a			
Moderate food insecure	6a			
	7a			
Severely food insecure	8a			
	9a			

- the HFIAS can be used as a continuous measure of the degree of food insecurity (access) in the household with 0-27 score

- the higher the score, the more food insecure the household is considered

- households can be categorized into four levels of household food insecurity (access):

1) food secure, 2) mild, 3) moderately and 4) severely food insecure.

**HFIAS category = 1** if [(Q1a=0 or Q1a=1) and Q2=0 and Q3=0 and Q4=0 and Q5=0 and Q6=0 and Q7=0 and Q8=0 and Q9=0]

**HFIAS category = 2** if [(Q1a=2 or Q1a=3 or Q2a=1 or Q2a=2 or Q2a=3 or Q3a=1 or Q4a=1) and Q5=0 and Q6=0 and Q7=0 and Q8=0 and Q9=0]

**HFIAS category = 3** if [(Q3a=2 or Q3a=3 or Q4a=2 or Q4a=3 or Q5a=1 or Q5a=2 or Q6a=1 or Q6a=2) and Q7=0 and Q8=0 and Q9=0]

**HFIAS category = 4** if [Q5a=3 or Q6a=3 or Q7a=1 or Q7a=2 or Q7a=3 or Q8a=1 or Q8a=2 or Q8a=3 or Q9a=1 or Q9a=2 or Q9a=3]



# Material and methods

- Data: primary survey; 710 questionnaires distributed among small-scale farmers in January-March 2018 in Poland
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- HFIAS indicator: experience-based food insecurity scale based on Household Food Insecurity Access Scale:
  - HFIAS category
  - HFIAS score
- Econometric strategy: zero-inflated Poisson (ZIP) regression model

# Results

57% (402) were classified as food secure and 43% (308) as food insecure.

Household Food Insecurity Access Scale survey among Polish small-scale farms in 2018  
(no. of positive responses)

Do You or Your Household Members Have the Following Problems with Ensuring Food Security Due to Financial Problems:	Last 30 Days			Total	Total in %	In the Last Year	
	1–2 Times	3–10 Times	>10 Times			It was Happening Regularly in the Last Year	in %
Worry about not having enough food	41	14	2	57	8.0%	24	3.4%
Do not eat your preferred food	160	59	14	233	32.8%	115	16.2%
Limit the diversity/quality of meals	137	55	7	199	28.0%	91	12.8%
Consume products that you would not like to eat in a better material situation	137	59	8	204	28.7%	92	13.0%
Limit the number of meals	51	11	1	63	8.9%	26	3.7%
Limit eaten food portions	30	13	1	44	6.2%	23	3.2%
Skip a meal because you could not afford to buy food	33	15	1	49	6.9%	28	3.9%
Go to sleep being hungry	20	2	0	22	3.1%	13	1.8%
Stay out of food all day	10	0	0	10	1.4%	10	1.4%

Note: No. obs. = 710, Cronbach's alpha 0.79.

HFIAS category: ■ food secure (402) ■ mild food insecure (167) ■ moderate food insecure (80) ■ severe food insecure (61)

# Results

Variables	Coef.	Std. Err.	IRR	p	[95% Conf. Interval]		VIF
<b>HFIAS score model</b>							
<b>Age of farm manager (dummy): &lt; 40 ref.</b>							
40-60	<b>-0.319</b>	<b>0.080</b>	<b>0.727</b>	<b>0.000</b>	<b>-0.475</b>	<b>-0.163</b>	<b>1.73</b>
>60	<b>-0.522</b>	<b>0.122</b>	<b>0.593</b>	<b>0.000</b>	<b>-0.761</b>	<b>-0.282</b>	<b>1.72</b>
<b>Gender of farm manager(dummy): Female ref.</b>							
Male	-0.087	0.086	0.917	0.313	-0.255	0.082	1.04
<b>Education of farm manager (dummy): No or primary ref.</b>							
Vocational	0.094	0.131	1.099	0.472	-0.163	0.351	3.19
Secondary	<b>-0.553</b>	<b>0.252</b>	<b>0.575</b>	<b>0.028</b>	<b>-1.048</b>	<b>-0.058</b>	<b>1.54</b>
Higher	<b>-0.298</b>	<b>0.176</b>	<b>0.742</b>	<b>0.091</b>	<b>-0.643</b>	<b>0.048</b>	<b>3.06</b>
<b>Number of household members (dummy): 1-2 ref.</b>							
3-4	0.132	0.085	1.141	0.121	-0.035	0.299	1.68
5 and more	<b>0.414</b>	<b>0.112</b>	<b>1.512</b>	<b>0.000</b>	<b>0.193</b>	<b>0.634</b>	<b>1.95</b>
<b>Children under 18 in the household (dummy): No children ref.</b>							
Yes	<b>-0.263</b>	<b>0.083</b>	<b>0.769</b>	<b>0.001</b>	<b>-0.425</b>	<b>-0.101</b>	<b>1.68</b>
Share of budget. transf. in income (%) (cont.)	0.000	0.003	1.000	0.943	-0.005	0.005	1.16
Off-farm income share (%) (cont.)	-0.002	0.002	0.998	0.383	-0.006	0.002	1.13
Distance to market (km) (cont.)	-0.004	0.004	0.996	0.306	-0.012	0.004	1.08
Market integration index (cont.)	0.087	0.055	1.090	0.116	-0.021	0.194	1.25
<b>Production type (dummy): Field crops ref.</b>							
Horticultural crops	0.237	0.208	1.267	0.255	-0.171	0.645	1.41
Permanent crops	<b>0.447</b>	<b>0.164</b>	<b>1.564</b>	<b>0.007</b>	<b>0.125</b>	<b>0.769</b>	<b>1.25</b>
Dairy cows	<b>0.200</b>	<b>0.112</b>	<b>1.222</b>	<b>0.073</b>	<b>-0.019</b>	<b>0.420</b>	<b>1.14</b>
Other grazing livestock	-0.192	0.121	0.826	0.112	-0.428	0.045	1.25
Granivores	0.237	0.201	1.267	0.239	-0.158	0.631	1.09
Mixed	-0.052	0.080	0.949	0.516	-0.209	0.105	1.42
Land productivity (cont.)	<b>-0.042</b>	<b>0.013</b>	<b>0.959</b>	<b>0.001</b>	<b>-0.067</b>	<b>-0.016</b>	<b>2.08</b>
Labor productivity (cont.)	-0.001	0.001	0.999	0.254	-0.001	0.001	1.32
Capital productivity (cont.)	0.000	0.000	1.000	0.921	-0.000	0.000	2.14
_cons	1.463	0.266	1.267	0.000	0.941	1.984	
<b>Zero-Inflated model</b>							
<b>Disposable income per capita (euro) (dummy): &lt;162 ref.</b>							
≥ 162	<b>0.534</b>	<b>0.201</b>	<b>0.534</b>	<b>0.008</b>	<b>0.141</b>	<b>0.927</b>	
_cons	-0.279	0.180	-0.279	0.122	-0.632	0.075	
Zero-inflated Poisson regression				Number of obs. = 710			
Non-zero obs. = 312				Zero obs. = 398			
Inflation model = logit							
LR chi2(22) = 82.43							
Log likelihood = -1199.98							
Prob > chi2 = 0.0000							

# Conclusions

- The influence of disposable income, age and education level of farm manager on the household food insecurity situation is negative.
- Family size is negatively correlated with the food security level of surveyed farms, as this negative relation is significant only for households of more than five members. Our study indicated that the presence of children under 18 in the household positively influences food security.

# Conclusions

- The structure of income, i.e., the share of budget support in income and off-farm income does not significantly affect the level of food insecurity.
- The distance to the market and marketization level are statistically insignificant in our research.
- Food security among the small farms is determined by land productivity. The farms specialized in dairy cows and permanent crops are more exposed to food insecurity in comparison to crops farms.

# Conclusions

- There is not the “non-significant” problems in developed countries. Evaluation and monitoring of households food security in developed countries need not only a regular survey, but a regular survey employing the same measures.
- There is a need to identify vulnerable households exposed to food insecurity and for wider and more in-depth research on the lack of food security in developed countries.
- Conducted studies at the country level can be misleading, so there is a need to focus on the household-level what is crucial for formulating and assessing food security policy.

# Conclusions

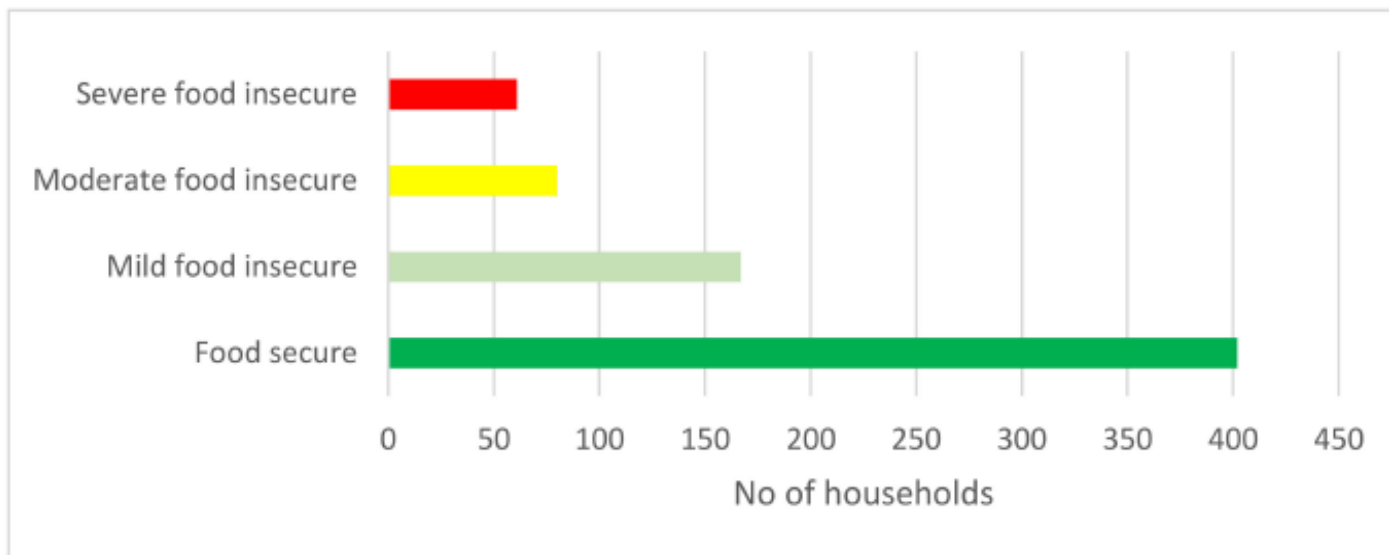
- And what about NAWA partners?

# Thank you!

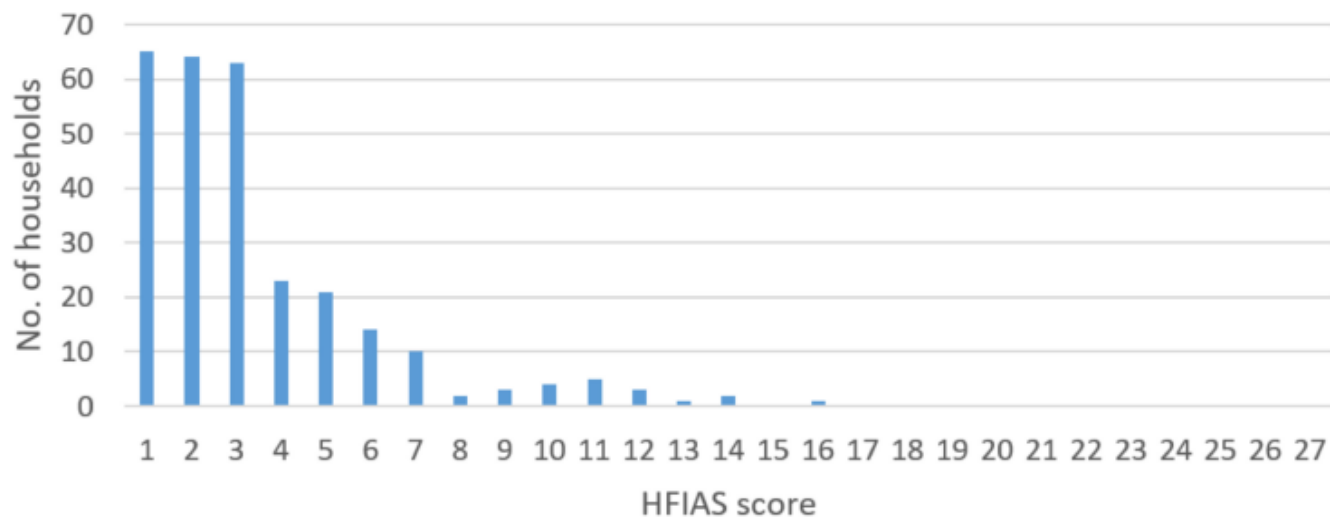


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**Figure 1.** Count of households in Household Food Insecurity Access Scale (HFIAS) categories. Source: own survey.



**Figure 2.** Distribution of food insecure households (HFIAS score > 0). Source: own survey.

# Prevalence of food insecurity severity levels by socio-demographic characteristics, income characteristics and farm characteristics.

Variable	Food Insecure (n = 402)	Moderate Food Insecure (n = 167)	Moderate Food Insecure (n = 80)	Severe Food Insecure (n = 61)	p-Value
<b>Age of farm manager (avg.)</b>	49.13	48.78	46.55	45.55	<b>0.034<sup>a</sup></b>
Gender of farm manager (%)					
Male (n = 581)	56.80	21.92	11.54	7.75	0.376 <sup>b</sup>
Female (n = 129)	55.81	25.71	10.08	12.40	
<b>Education of farm manager (%)</b>					
Primary (n = 41)	51.22	26.83	14.63	7.32	<b>0.035<sup>b</sup></b>
Vocational (n = 560)	56.07	24.64	10.71	8.57	
Secondary (n = 21)	52.38	28.57	9.52	9.52	
Higher (n = 88)	63.64	13.64	13.64	9.09	
Number of household members (avg.)	3.06	3.08	3.29	3.18	0.631 <sup>a</sup>
Number of children under 18 (avg.)	0.55	0.67	0.65	0.67	0.459 <sup>a</sup>
Share of budgetary transfers in income (%) (avg.)	7.38	7.89	9.02	7.36	0.654 <sup>a</sup>
Off-farm income share (%) (avg.)	10.81	7.35	9.46	15.16	0.076 <sup>a</sup>
Distance to market (km) (avg.)	11.84	12.70	11.34	13.26	0.286 <sup>a</sup>
Market integration index (avg.)	3.97	3.89	3.94	3.97	0.490 <sup>a</sup>
<b>Production type (%)</b>					
Field crops (n = 268)	54.48	21.64	13.81	10.07	<b>0.038<sup>b</sup></b>
Horticultural crops (n = 36)	66.67	22.22	2.78	8.38	
Permanent crops (n = 26)	38.46	34.62	11.54	15.38	
Dairy cows (n = 46)	47.83	21.74	21.74	8.70	
Other grazing livestock (n = 77)	58.44	27.27	7.79	6.49	
Granivores (n = 27)	66.67	22.22	7.41	3.70	
Mixed (n = 230)	59.57	23.91	9.13	7.39	
Land productivity (thousands PLN/ha) (avg.)	5.13	5.21	4.19	3.60	
Labor productivity (thousands PLN/AWU <sup>c</sup> ) (avg.)	46.37	43.69	49.58	31.02	0.049 <sup>a</sup>
Capital productivity (thousands PLN) (avg.)	178.83	158.70	159.72	143.76	0.066 <sup>a</sup>
<b>Disposable monthly income per capita (euro) (%)</b>					
<162 (n = 140)	45.71	25.71	15.00	3.57	<b>0.011<sup>b</sup></b>
≥162 (n = 570)	59.30	22.98	10.35	7.37	

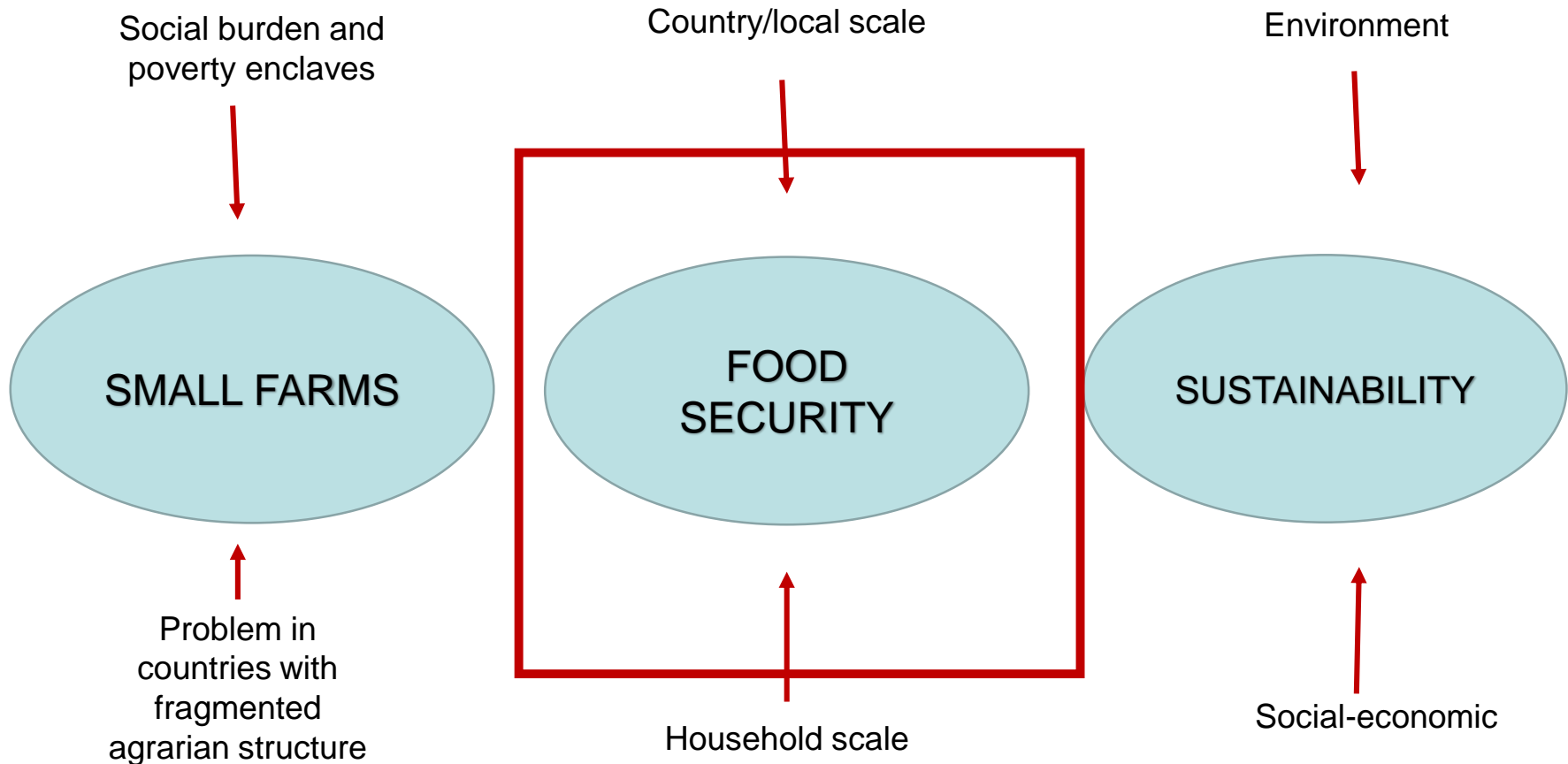
<sup>a</sup> Anova/Kruskal-Wallis, <sup>b</sup> Chi-sq, <sup>c</sup> Annual Work Unit is equivalent to one person working full-time on the holding. In Poland, AWU is equal to 2120 h of work per year. Note: bolded parameters are significant at  $p < 0.05$ . Source: own calculations.

# Results \_ coping strategies

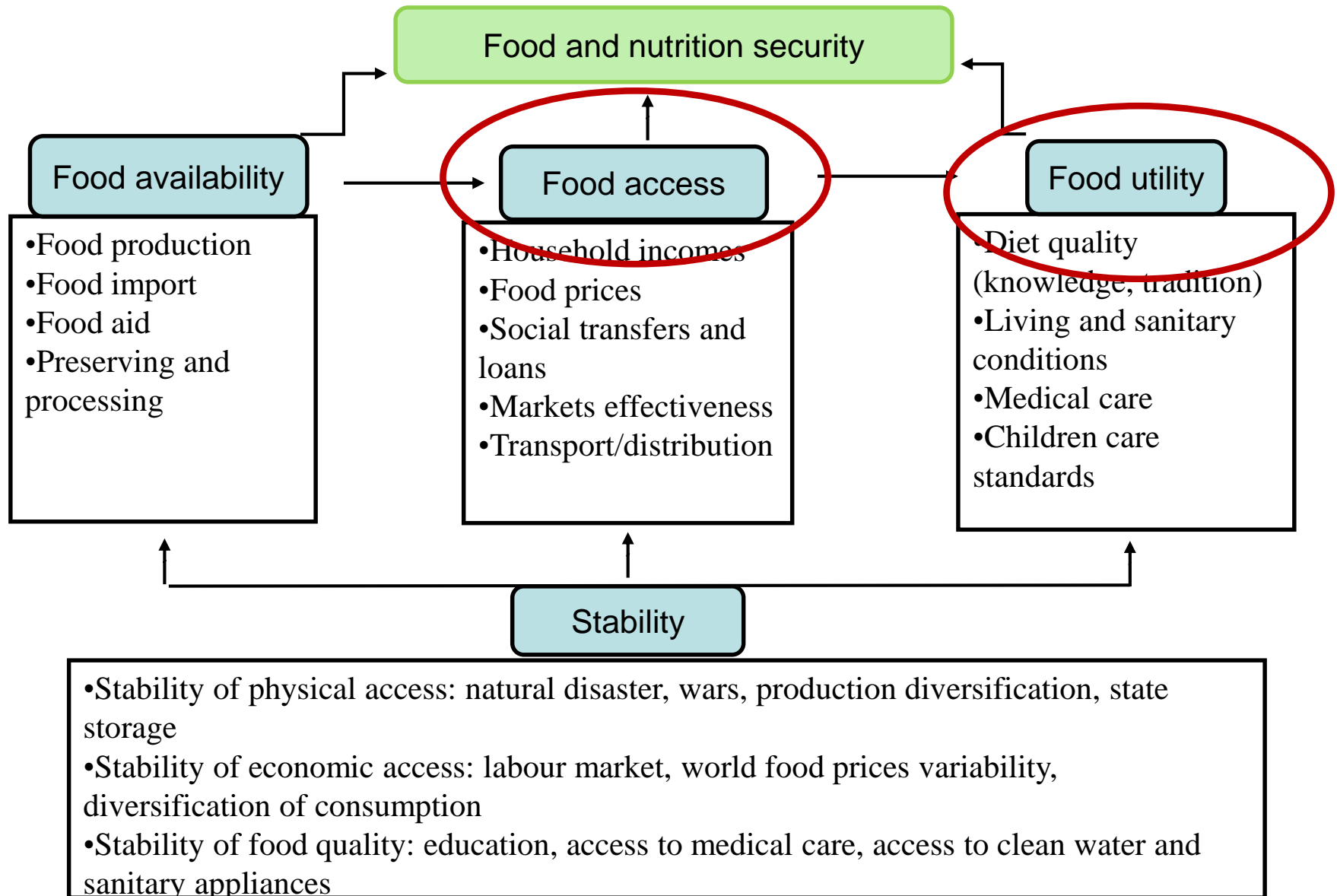
Have you or your household members have to take the following actions due to the financial problems:	Last 30 days					In the last year	
	1-2 times	3-10 times	>10 times	Total	Total in %	It was happening regularly	in %
Take loan to buy food or put on tab	17	3	1	21	3,0%	21	3,0%
Borrow food or rely on family / friends	17	5	1	23	3,2%	18	2,5%
Eat with someone else's household	20	7	5	32	4,5%	22	3,1%
Consume products that were supposed to be used on farm	27	7	2	36	5,1%	21	3,0%
Collect food, hunt or fish	14	14	2	30	4,2%	34	4,8%
Ask for food	1	0	0	1	0,1%	10	1,4%
Opt out of other purchases to buy food	111	31	8	150	21,1%	71	10,0%
Choose between buying food and paying "bills"	66	10	3	79	11,1%	13	1,8%
Buy less preferred or cheaper food	157	99	36	292	41,1%	178	25,1%
Adults have had to limit the amount of food they eat to feed their children	20	3	1	24	3,4%	19	2,7%

# Determinants of food security and sustainable development of semi-subsistence farms in Poland

## PROJEKT



# Food and nutrition security dimensions and determinants



# Motivation

- Recurrent food crises and global change pushed food security to the top of the political agenda.
- People in developed countries are food secure in terms of having enough food for an active, healthy life – taken for granted
- However, up to 12 percent of the population of the United States (USDA ERS 2017) and 9 percent of the EU28 (Eurostat 2017) population have experienced food insecurity.
- In US: HFIAS - household food insecurity and access scale survey
- In Europe: **to what extent people can afford a meal with meat, chicken, fish, or vegetarian equivalent every second day** – the question was included in a questionnaire dealing with poverty and social inequality in Europe (**niedociągnięcie, grupy wrażliwe, migranci**)
- The tendency of perceiving and handling food in/security as an implicit part of the concept of poverty



# Motivation

- Some reports ... but almost no publications
- Deal with issue:
  - how EU can help in global food security
  - on environmental issues
  - focused on food supply ...but not on access
- Borch, A. Kjærnes U., Food security and food insecurity in Europe: An analysis of the academic discourse (1975-2013), Appetite 2016.
  - food security 7193 (129 including Europe)
  - food insecurity 2141 (14 including Europe)

# Motivation – food insecurity in Poland

- 900 thousand children live in severe poverty (GUS) – but how many of them experience food insecurity
- 3% can not afford to provide enough proteins and vitamins to children (GUS „Living conditions of families in Poland)
- 130 thousand malnourished children („Share the meal” programe)
- Less malnourished children in countryside