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Household food waste composting habits and behaviours in Hungary: a segmentation study

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Bio-waste and food waste in EU and Hungary

34% (86 million tonnes) of municipal solid waste is bio-waste in the EU-28 (*EEA, 2020*)

Food waste represents 60% of the total municipal bio-waste in the EU-28 (*EEA, 2020*)

65.5 kg/person/year food waste is generated in Hungarian households (*Kasza et al., 2020*)

In 2017 43% of municipal bio-waste was collected separately (*EEA, 2020*)



European Environmental Agency (2020). Bio-waste in Europe – turning challenges into opportunities

Kasza, G., Dorkó, A., Kunszabó, A., & Szakos, D. (2020). Quantification of household food waste in Hungary: A replication study using the FUSIONS methodology. Sustainability, 12(8), 3069.

Policy context

Waste Framework Directive:

by **2030**, the preparing for **re-use** and the **recycling** of municipal waste shall be increased to a minimum of **60 %** by weight;

by **2035**, the preparing for **re-use** and the **recycling** of municipal waste shall be increased to a minimum of **65 %** by weight.

Landfill Directive:

Member States shall take the necessary measures to ensure that by **2035** the amount of municipal waste **landfilled is reduced to 10 %** or less of the total amount of municipal waste generated (by weight).

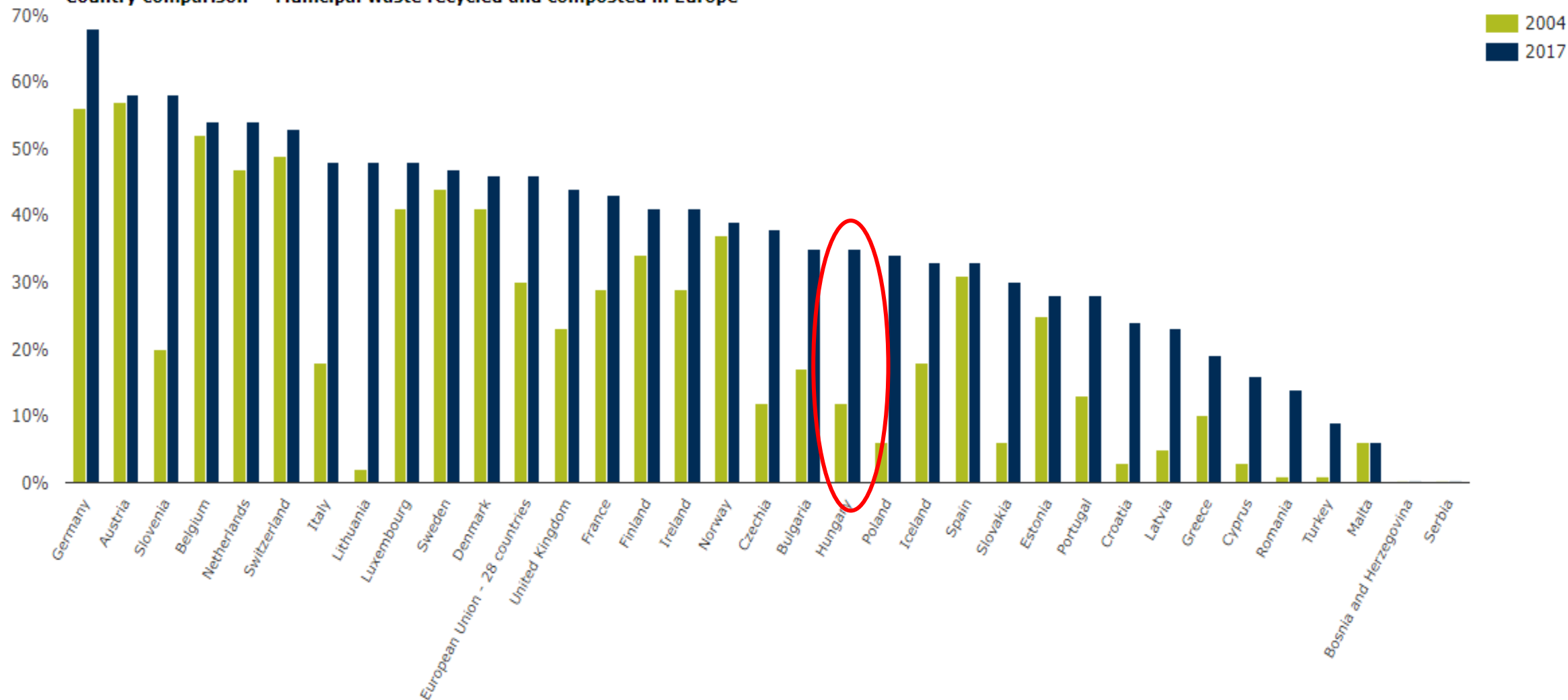
Farm to Fork Strategy:

The Commission is committed to **halving per capita food waste** at retail and **consumer** levels by 2030 (**SDG Target 12.3**). Using the new methodology for measuring food waste and the data expected from Member States in 2022, it will set a baseline and propose legally binding targets to reduce food waste across the EU.

Waste hierarchy



Country comparison – Municipal waste recycled and composted in Europe



Research gap

Socioeconomic background of household food wastage and composting in Hungary



Understanding attitudes, motivation, behaviour of citizens



Aims

- Collect data about Hungarian citizens' **home composting practice**
- Determine the perceived **advantages**, **barriers** and possible **incentives** of composting
- Examine the relationship between pro-environmental **attitude**, **food waste** behaviour and **composting** habits
- **Segment the citizens** as regards their composting practice, pro-environmental attitude and food waste behaviour
- **Demographic profiling** of the segments

Research method



Sampling:
personal interviews



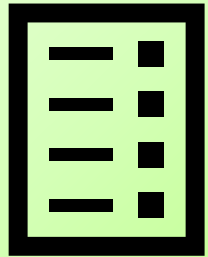
Survey period:
16/07/2020 – 07/09/2020



1002 respondents



Representativity:
age, sex, geographical location



Quantitative consumer survey
Design of the questionnaire
Applied questions – Single-choice,
multiple-choice, 1-5 Likert-scale

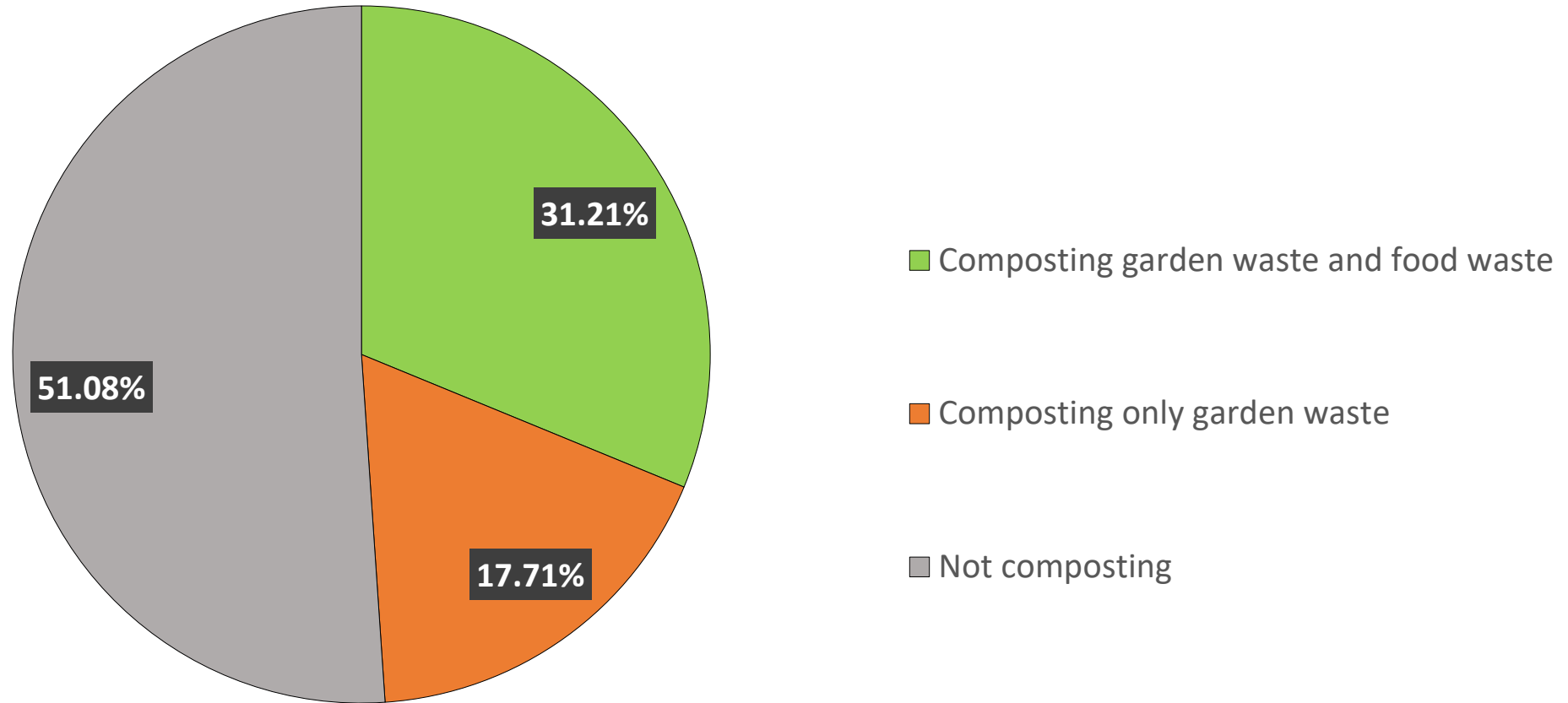


Data analysis

- IBM SPSS 25.0
- Descriptive statistics (mean, st. dev., cross-tabs)
- Cluster analysis (Ward's method, K-means method)

Results

Household composting practices



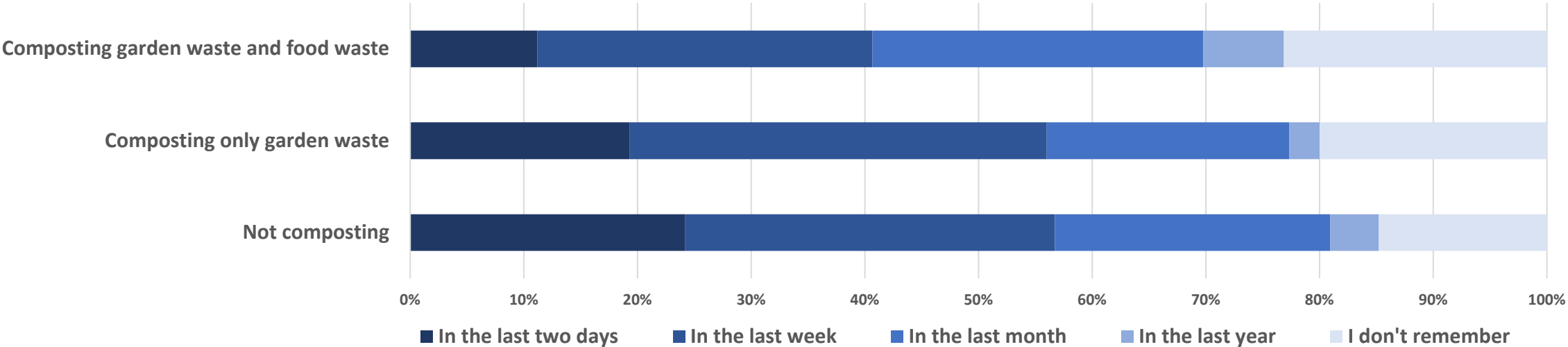
Perceived benefits, barriers and incentives of composting

| Benefits | | |
|--|------|----------|
| Statement | Mean | St. Dev. |
| We can contribute to environmental protection if we compost | 4.64 | 0.810 |
| I produce less garbage | 4.54 | 0.955 |
| The humus produced during composting can be well used in gardening | 4.50 | 1.026 |
| Composting can save money | 3.67 | 1.450 |
| I think composting is interesting | 3.39 | 1.541 |
| Barriers | | |
| Statement | Mean | St. Dev. |
| There is no proper place | 3.28 | 1.523 |
| Rodents can multiply because of composting | 2.95 | 1.575 |
| I don't know how to compost | 2.94 | 1.585 |
| I don't produce that much food or garden waste to be worth it | 2.90 | 1.551 |
| I couldn't utilize the humus | 2.87 | 1.463 |
| Composting is too cumbersome | 2.83 | 1.466 |
| Insects multiply because of composting | 2.82 | 1.476 |
| I think composting requires a lot of time | 2.62 | 1.411 |
| I am simply not interested in composting | 2.62 | 1.497 |
| I think composting is smelly | 2.60 | 1.554 |
| I don't have the opportunity because of others (e.g. neighbours) | 2.47 | 1.471 |
| I can't/don't want to spend money on composting | 2.30 | 1.650 |
| Incentives | | |
| Statement | Mean | St. Dev. |
| Presence of garden in the household | 4.13 | 1.321 |
| Freely available compost bin | 3.69 | 1.507 |
| Discounted garbage collection fee | 3.66 | 1.481 |
| Trustworthy information about composting | 3.61 | 1.476 |
| Community composting close to my home | 3.35 | 1.627 |
| If my family members or friends would compost also | 3.26 | 1.527 |

Connection between attitude and composting

| Attitude statements | Composting practice | Mean | St. Dev. | P value* |
|--|--|------|----------|----------|
| Environmental protection is important for me | Composting garden waste and food waste | 4.81 | 0.632 | <0.001 |
| | Composting only garden waste | 4.69 | 0.631 | |
| | Not composting | 4.56 | 0.731 | |
| My life is environmentally friendly, thus I don't discard food | Composting garden waste and food waste | 4.01 | 0.977 | <0.001 |
| | Composting only garden waste | 3.82 | 1.167 | |
| | Not composting | 3.69 | 1.107 | |
| I strive for selective waste collection in my household | Composting garden waste and food waste | 4.63 | 0.806 | <0.001 |
| | Composting only garden waste | 4.52 | 0.871 | |
| | Not composting | 4.13 | 1.142 | |
| I like gardening | Composting garden waste and food waste | 4.27 | 1.162 | <0.001 |
| | Composting only garden waste | 4.09 | 1.266 | |
| | Not composting | 3.25 | 1.445 | |

* Results of Kruskal-Wallis test



Segmentation analysis – involved questions

| Question | Question type | Answers |
|--|------------------|--|
| To what extent do you agree with the following statement? | 1-5 Likert scale | Environmental protection is important for me |
| | | My life is environmentally friendly, thus I don't discard food |
| | | I strive for selective waste collection in my household |
| | | I like gardening |
| What was the last time you discarded food? | Single-choice | In the last two days |
| | | In the last week |
| | | In the last month |
| | | In the last year |
| | | I don't remember |
| What type of property do you live in? | Single-choice | House with garden |
| | | Flat with garden |
| | | Flat without garden |
| Do you compost the food waste generated in your household? | Single-choice | Yes |
| | | No, only the garden waste |
| | | I don't compost |

Identified segments



| | Average composters | Uninterested urban citizens | Helpless apartment residents | Active environmentalists |
|-----------------|--------------------|-----------------------------|------------------------------|--------------------------|
| Number of cases | 214 | 121 | 242 | 244 |
| Percent | 26.07% | 14.74% | 29.48% | 29.72% |

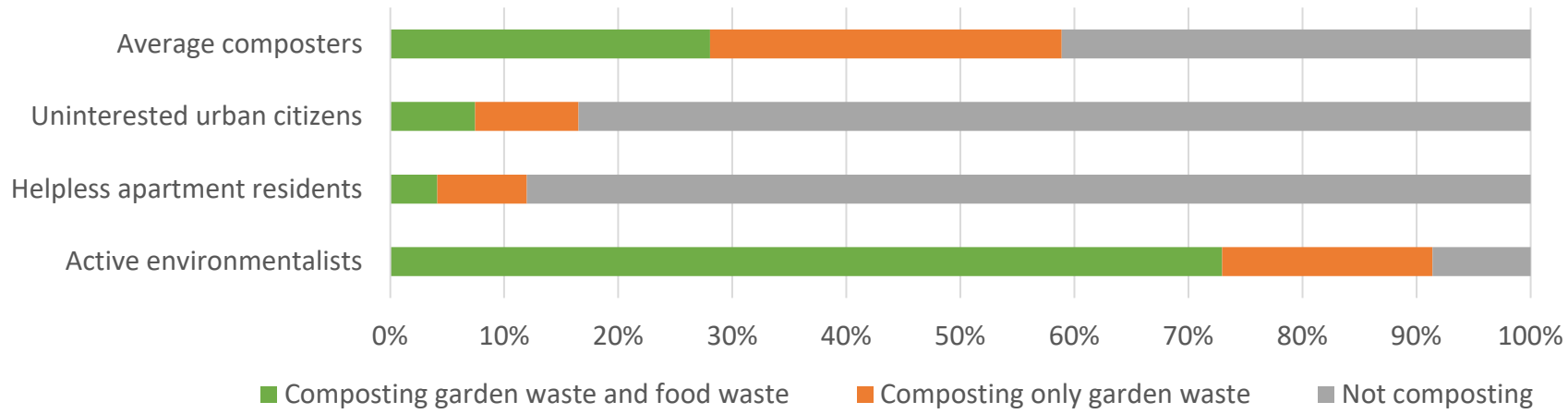


Demographic profiling of the clusters

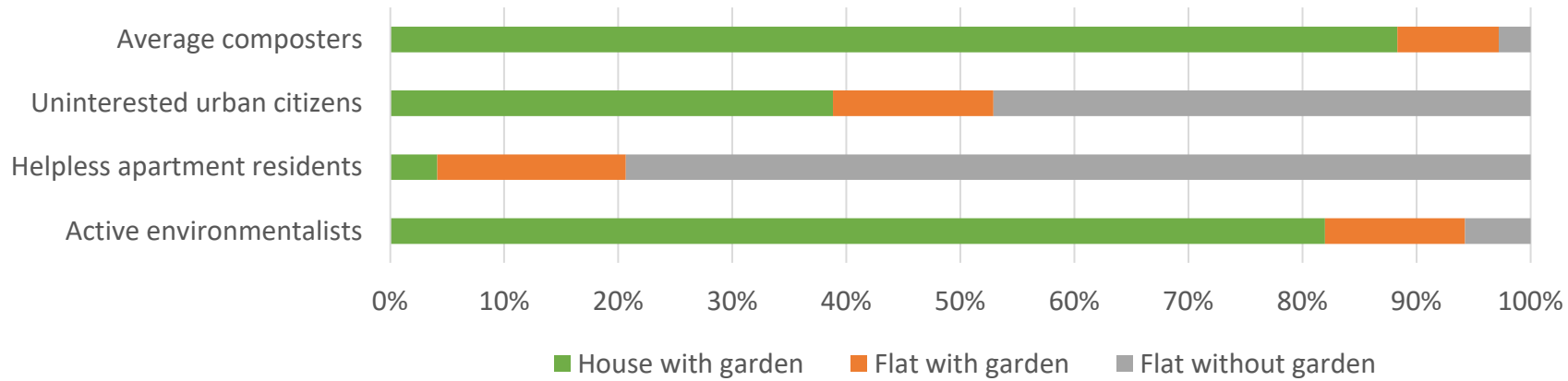
| Demographic characteristic | | Average composters | Uninterested urban citizens | Helpless apartment residents | Active environmentalists | P value* |
|---------------------------------------|-----------|--------------------|-----------------------------|------------------------------|--------------------------|----------|
| | | % | % | % | % | |
| Sex | Female | 56.54 | 42.97 | 51.24 | 58.20 | < 0.001 |
| | Male | 43.46 | 57.03 | 48.76 | 41.80 | |
| Age | 18-29 | 25.23 | 36.36 | 11.57 | 13.52 | < 0.001 |
| | 30-39 | 11.22 | 25.62 | 23.14 | 11.07 | |
| | 40-59 | 41.59 | 28.10 | 36.78 | 31.15 | |
| | >60 | 21.96 | 9.92 | 28.51 | 44.26 | |
| Place of living | Village | 25.23 | 14.29 | 4.98 | 30.00 | < 0.001 |
| | City | 60.75 | 66.39 | 57.26 | 56.67 | |
| | Capital | 14.02 | 19.32 | 37.76 | 13.33 | |
| Number of persons in the household | 1 | 7.69 | 19.49 | 29.83 | 17.57 | < 0.001 |
| | 2 | 28.85 | 30.51 | 40.34 | 38.49 | |
| | 3 | 23.08 | 20.34 | 18.07 | 19.67 | |
| | 4 | 22.60 | 16.95 | 6.72 | 12.13 | |
| | 5 or more | 17.78 | 12.71 | 5.04 | 12.14 | |
| Presence of children in the household | Yes | 33.18 | 28.10 | 14.11 | 24.79 | < 0.001 |
| | No | 66.82 | 71.90 | 85.89 | 75.21 | |

* Results of Kruskal-Wallis test

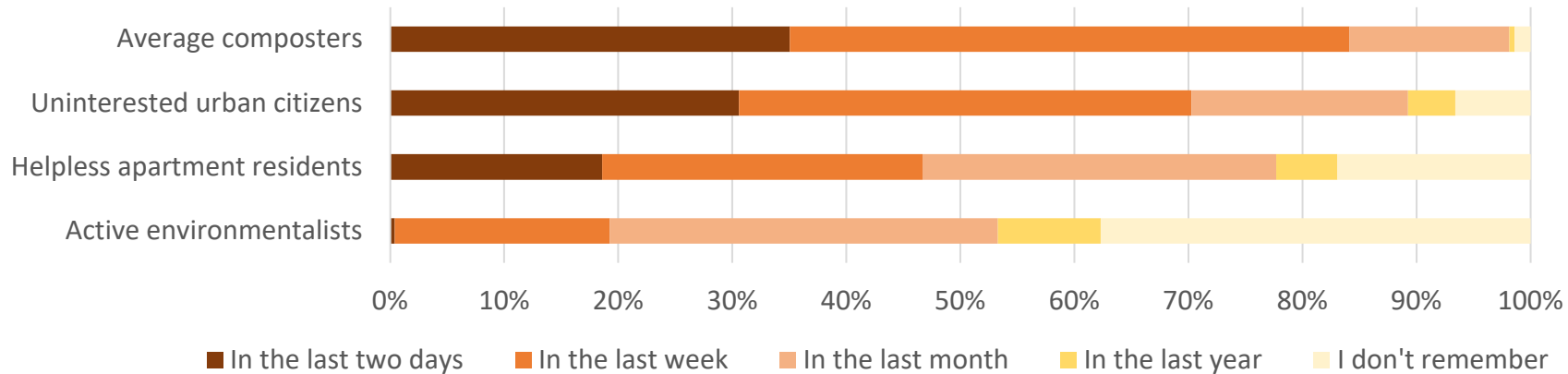
Profiling by the segmentation variables



Composting

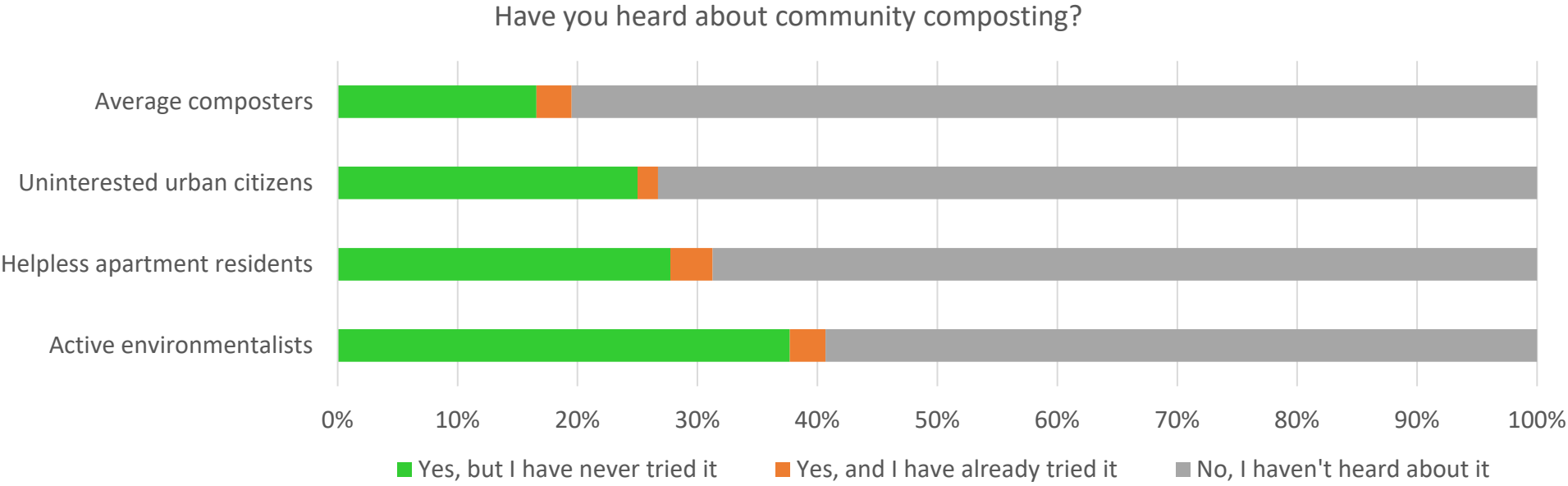


Type of property



Last time of food discard

| Attitude statements | Average composters | Uninterested urban citizens | Helpless apartment residents | Active environmentalists |
|--|-----------------------|-----------------------------------|------------------------------------|-----------------------------|
| | Mean values | | | |
| Environmental protection is important for me | 4.73 | 3.58 | 4.81 | 4.97 |
| My life is environmentally friendly, thus I don't discard food | 3.19 | 2.68 | 4.12 | 4.62 |
| I strive for selective waste collection in my household | 4.48 | 2.84 | 4.55 | 4.81 |
| I like gardening | 4.17 | 2.36 | 3.07 | 4.59 |



Conclusions

- Introduce **campaigns** to promote composting
- Provide **practical knowledge** and emphasize the **benefits** of composting
- Promote other **pro-environmental behaviours** along with the promotion of composting
- Introduce household **food waste prevention** practices

Providing relevant input to our consumer awareness campaign on food waste prevention called ,**Wasteless**' <http://maradeknelkul.hu/en/>

- Involve **young adults**, city dwellers and families in food waste valorisation actions
- **Community composting** → close to large housing estates, urban areas
- **Household composting** to be promoted in less densely populated areas
- Paying attention to **hygiene, food safety**

Thank you for your attention!