Operation conditions of refrigerator and freezer in private homes in Europe with relevance to food storage quality

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for
3rd CCM workshop
Background

- European Commission is working on a program to renew its Energy policy for Energy using Products (EuPs)
- Studies are launched per product category to assess 'Eco-Design' for these products
- „Lot 13“ is the study on refrigerators and freezer (www.ecocold-domestic.org)
- Uni Bonn / Household Appliances and Technology Section has made the assessment of 'Consumer behaviour' for Lot 13
Consumer survey

Demography
EU-coverage of consumer investigation

- 10 countries
- 250 consumers involved in doing housekeeping
- representative in age and household size
- interviewed via questionnaire
- professional online panel
Operating conditions with relevance to food storage quality

- Cold equipment used in private homes
- Operating conditions
  - Temperature setting
  - Temperature stability
  - Loading
Almost only 4 categories left:
1: refrigerators only
7: refrigerator + *(***) freezer
8: freezer upright,
9: chest freezer
Temperature controls

Setting

°C- control
Only ~50% have exact temperature regulation.
Operating conditions

- Temperature setting
- Temperature stability
- Loading behaviour and consumer preferences
Main refrigerator: Average temperature setting - °C

- Average is o.k., but huge variation

n=1.348
To which temperature or setting do you generally adjust your main refrigerator? °C

Average = 5 °C

Critical for food preservation

n=1,348
To which setting do you generally adjust your freezer/chest freezer?

"°C"

Average = -17°C

Critical for food preservation

n=560

sektion haushaltstechnik

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In up to 50% of all households the ambient temperature does not fit the abilities of the refrigerator.
Do you cool prepared food down before you put it into the refrigerator?

~10% never cool down prepared food

~20% do not cool down prepared food always

n=2.497
Which of the following refrigerator features have what priority for you?

- Smaller load capacity
- Network connectivity; communication between household appliances
- Greater convenience offered by the appliance (ice cubes or water dispenser, ...)
- Greater load capacity
- New hygienic surfaces or effects
- Improved cooling performance adapted to the food (several cooling areas)
- Improved cooling control (adjustment to loading, environment, etc.)
- Lower price of the appliance
- Improved storage possibilities (larger, removable storage baskets, shelves, bottle racks, ...)
- Easy or automatic defrosting
- Lower running costs
- Lower energy consumption

(low priority) 1 2 3 4 5 6 7 8 9 10 (high priority)
Summary

- Most used cold appliances are combined refrigerators/ freezers (most with just one cooling cycle for both compartments)
- Many refrigerators/ freezers are running outside of the defined ambient temperatures (climate classes)
  - In northern countries: located in heated rooms
  - In southern countries: located in unheated rooms, like balcony, garage
  - Running refrigerators/ freezers outside the climate class may overstress the capacity of the cooling cycle and cause temperature to get out of control
- Temperature setting is country dependent and up to 12 °C for refrigerators
- Only 80% of the consumers cool down things before loading them
- Consumer ask for improvements in performance and flexibility
Thank you very much!

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