European School Fruit Scheme in North Rhine-Westphalia (Germany) – Does it work?
Sarah Wingensiefen, Gesa Maschkowski and Monika Hartmann
Institute for Food and Resource Economics, Bonn University; Bonn, Germany

Introduction
Theoretical background
• Nutrition behavior is a complex construct with multiple interdependencies (e.g. Glanz and Bishop 2013).
• Personal, behavioral and environmental factors influence children's dietary behavior (e.g. Bandura 1986; see F1).
• Interventions with a multi-component approach are most promising to positively affect nutritional behavior (Van Cauwenberge et al. 2009).

Research objectives & Study design
1 Analyse the acceptance of the SFS in NRW.
2 Examine the scheme’s impact on children’s total F&V intake frequency.
3 Identify potential influencing factors.

Study design & Study population
• Multi-component study with a pretest and after 1 year of intervention-start design including intervention and control group (see F2).
• Children and teachers were interviewed.
• Teachers at follow up (2011).

Methodology & Data

Analysis
• F&V intake frequency per day was counted, based on the 24h food recall (follow up included SF&S F&V).
• Potatoes, F&V juices and most of the combination foods were excluded.
• Wilcoxon rank-sum test was conducted to identify the difference in F&V consumption between baseline and follow up.
• To detect and control for potential influencing factors of the intervention three mixed linear regression models were estimated (see F4).

Results
F1: F&V consumption frequency – baseline and follow up
<table>
<thead>
<tr>
<th>Group</th>
<th>Baseline</th>
<th>Follow up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td></td>
<td></td>
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<tr>
<td>- I. overall (n=390)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- II. lower baseline intake (0-1x) (n=257)</td>
<td>1,26</td>
<td>2,02 ***</td>
</tr>
<tr>
<td>- III. higher baseline intake (&gt;1x) (n=133)</td>
<td>0,44</td>
<td>1,77 ***</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- I. overall (n=109)</td>
<td>1,31</td>
<td>1,18</td>
</tr>
<tr>
<td>- II. lower baseline intake (0-1x) (n=70)</td>
<td>0,50</td>
<td>0,71</td>
</tr>
<tr>
<td>- III. higher baseline intake (&gt;1x) (n=39)</td>
<td>2,77</td>
<td>2,03 **</td>
</tr>
</tbody>
</table>

F2: How do you like the SFS? (n=398 children)

Questionnaires
• Children: 1st part: 24h food recall filled in as a whole class exercise, developed within the scope of "Grab 5 Project" in the UK (Edmunds and Ziebland 2002) and adjusted for this study (see F3). 2nd part: questions concerning knowledge, attitudes and beliefs.
• Teachers: Questions about organization, assessment of the program and accompanying nutrition education measures.

F3: 24h recall, first page

F4: Structure of variables in the linear mixed regression models

Conclusions
• There are few studies that measure young children’s F&V consumption through self-reporting.
• Using a validated questionnaire, an intervention effect (change in F&V intake frequency) could be detected.
• Although multi-component intervention studies are known to advance intervention's success, nutrition education on class level shows no significant impact.
• Possibly there is a general estimation problem resulting from the small and unbalanced number of individuals on class level.

References

Contact
Sarah Wingensiefen, Bonn University
Email: Sarah.Wingensiefen@iwr.uni-bonn.de