How can producers of packaging contribute to improved package handling for women in the food industry?

birgitta.nilsson@innventia.com
Addressing the issue - efficient package handling

- Manual Handling
- Knowledge
- Responsibility
- Action
Traditions
The Packaging Producers

- Stora Enso
- SCA
- Ekmans
- Sun Chemicals
- Karamellpojkarna
- Jästbolaget
- Göteborgs Kex

Material producers → Packaging producers/converters → Fillers → Whole sale → Retail → Customers

Non-filled packages → Filled Packages
Three foodstuff companies,

- Where women manually or semi-manually handle primary and secondary packages

- Research steps
  - identification
  - documentation
  - development
  - evaluation
Identification

- Group discussions with workers concerning the packaging characteristics supporting or obstructing easy handling; followed by suggestions for improvements
- Questionnaires for self-evaluation of working conditions when handling packages

- Selection of project package

- Primary and/or secondary package
Documentation

- Interviewing the next step in the value chain, e.g. bakers and shop replenishers, regarding suggestions for improvements to the project packages.
- Observation and measurement of the work content, working time patterns and ergonomic load when handling ordinary packages.
Development,

- Discussions with packaging producers regarding improvements to the selected packages and production of prototypes
- Taking into account the production requirements, food companies, in cooperation with packaging designers reflected on how packaging, could be modified to limit the risk of injuries

- Prototype at Karamellpojkarna
Evaluation

- The physical workload
  - Postures and movement velocity of the upper back and upper arm were measured using inclinometers.
  - Wrist postures and movements were recorded using goniometers.
  - The muscular activity of the forearm flexor muscles was measured using EMG (Göteborgs Kex and Jästbolaget)

- Questionnaires for self-evaluation of working conditions when handling prototypes
Case study 1

Göteborgs kex
- suggested modification
- result
- Increase in surface friction
- Reduced muscle forces in the forearm
- Reduction in packages slipping by 30%

Project package; Salinas box
- 1 290 000 boxes/year, one week/month
- 850 production hrs
- 18 persons
Evaluation of ordinary boxes and production prototypes in a production-like set-up

Production

Prototypes
CS1 - Muscular activity handling original + prototypes at Göteborgs kex
CS1 - Coefficient of friction Salinas box

Original vs friction lacquer / friction lacquer + paint
Case study 2

- Jästbolaget
  - suggested modification
  - result
- Modification of
  - primary and secondary packages
  - production line
- Reduction in physical workload
- Reduction in no. of manual operations

- Project package; 500g dry yeast
- App. 270 tons/year and 2 tons/hrs. 4 persons
Case study 3

- **Karamellpojkarna**
  - suggested modification
  - result
- Modification of 2ndary packages
- Reduced wrist speed
- Reduction in no. of manual operations

- **Project package; corrugated box**
- 8 persons handles 126 tons of candybars/year
- App.1 ton per production day handled by 8 person
Prototype and productivity estimates

- Production data was collected from the companies in order to evaluate the influence on the handling of prototype packages.

- Productivity was estimated on the basis of company information, interviews, observations, video materials

- The evaluation of the prototypes in the case studies did not show a negative impact on productivity
In summary

- It is possible to reduce the workload in the manual handling of packages by changing the package per se.
- We believe that considerations to the ergonomics effects of a particular package should be included in the planning, design and specifications of that package throughout its value chain.