

## **THE BEAUTY AND THE BEAST – HOW QUALITY MANAGEMENT CRITERIA AT SUPERMARKETS CREATE FOOD WASTE**

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### **ABSTRACT**

The issue of food waste at farm and supplier level due to high visual quality criteria defined by retailers is an important issue for many Austrian producers and suppliers of fruit and vegetables. In the framework of a sustainability program initiated by an Austrian retailer, the topic was discussed in several product-specific stakeholder workshops. Surveys with farmers and suppliers of fruit and vegetables for Austrian supermarkets gave some data on the share of losses at harvest and at supplier level.

### **INTRODUCTION**

Worldwide, over 30 % of the food produced is lost at different stages of the value chain. The share of losses is especially high in fruit and vegetables. In industrialized countries, the most significant losses of fruit and vegetables occur at farm, distribution and consumer level, whereas losses due to storage and transport are less important (Gustavsson et al., 2011). The overall share of losses in fruit and vegetables in Europe is estimated at over 50 %. A rough estimation for Austria is that every year 175,000 t of edible fresh fruit and vegetable are lost at farm level; that is a share of about 25 % of the production (Leibetseder, 2012).

From a legal point of view, the EU marketing standards set out the quality standards that must be applied to the supply of fruit and vegetables in Europe in order to set a certain quality level in the market. On July 1st 2009, the European Union canceled specific marketing standards for 26 fruits and vegetables. Those products are now regulated by more general marketing standards focusing on hygienic and health related conditions. Another 10 specific marketing standards addressing 75 % of the inner European trade volume of fruits and vegetables (e.g. apples, strawberries, sweet pepper, kiwi fruit, tomato, salad) are still in force. In parallel to the EU standards retailers set their own specifications, which are often much more stringent.

The inspection or grading process, which checks if the products meet the standards is assumed to cause the most losses in agriculture (Gustavsson et al., 2011). Those fruits and vegetables, which do not fulfill the specifications may be downgraded or out-graded. Downgrading means that a product is classified into a lower class – e.g. apples marketed as

class II. Down- or. Out-grading leads to wastage of the products if no alternative utilization is established. According to results published by WRAP (2011) the grading losses of nine fruit and vegetables types varies between 1 and 25 % within the UK. The highest share of grading losses are with apples (25 %), onions (20 %), potatoes (13 %) and avocados (30 %).

## **METHODS)**

The Austrian environmental NGO GLOBAL 2000 cooperates with an Austrian supermarket chain and almost 400 Austrian producers and 40 associated suppliers of fruit and vegetables to achieve more sustainability in the value chain. In yearly product-specific stakeholder workshops farmers, suppliers, scientists, representatives from supermarkets, social and environmental NGOs discuss, which ecological and social hot spots have to be addressed in the value chain and how improvements can be made. In these workshops food waste due to high visual quality criteria is a frequently and emotionally discussed issue. Also part of the program is the calculation of the ecologic rucksack per kg of different products from field to supermarket shelves – based on data given by farmers, suppliers and supermarkets. GLOBAL 2000 determines resource and climate indicators (e.g. carbon emissions, resource use) and agricultural indicators (balances of humus, nitrogen and phosphorus, pesticide intensity, energy intensity). Harvest quotas (i.e. percentage of harvested produce) give an idea in which products lots of waste occurs at field level. Harvest quotas of around 1,500 harvested vegetable fields (between 2007 and 2011) have been analyzed. A survey on supplier level in spring 2013 included questions on food losses at this stage and alternative marketing strategies for products that do not correspond to retailer's quality criteria.

## **RESULTS**

### *1. Discussion in stakeholder workshops*

Farmers addressed the topic for the following products: potatoes, onions, cabbage, leek, spring onions, carrots, radish, apples. Visual quality standards of fruit and vegetables got ever stricter in the last decades. The abandonment of some legal standards of the EU in 2009 has not changed the situation since it is the retailers that call for these criteria. Farmers sometimes criticised that most supermarkets do not sell class II products today.

For all products detailed requirements concerning mass, size, shape and colour are made. High uniformity demands are difficult to fulfil and lead to food waste at farm level, e.g. in cabbage, salad, or leeks. Of course losses at field level do not only occur due to quality standards, but also due to fluctuating market conditions and low prices. For some products there is not only a conflict between “high external quality” and “little food waste”, but these objectives have also to be traded off against “little use of pesticides” and “low pesticide residues”. Good examples are moderate thrips damage in leek, or late infestation with scab (*Venturia inequalis*) on apples – two harmless external damages, which are not accepted by retailers and apparently consumers. Farmers want to avoid food waste not only because of economic reasons. Also on an emotional level they do not like to throw away good quality food just because it does not fulfill visual criteria. Nevertheless in some cases (e.g. for apples) the position of farmers is ambivalent, because some of them fear, that lower standards could put pressure on prices.

The situation for supermarkets is difficult: Supermarket managers admit, that consumers have been spoiled with ever “nicer” products and high gloss images in advertising. Now it is not easy for supermarkets to change the situation, because they fear negative consumer reactions. If one retailer lowers its external quality criteria, consumers could switch to the competing store. Or it could be accused to palm poor quality to consumers.

From an ecologic viewpoint wastage of fruit and vegetables is negative at first because more resources – including land, water, energy, nature – are consumed and more emissions occur. Furthermore for some vegetables (e.g. cabbage) low harvest quotas and underploughing of too much crop residues can cause high emissions of nitrate and nitrous oxide.

## 2. Data from survey

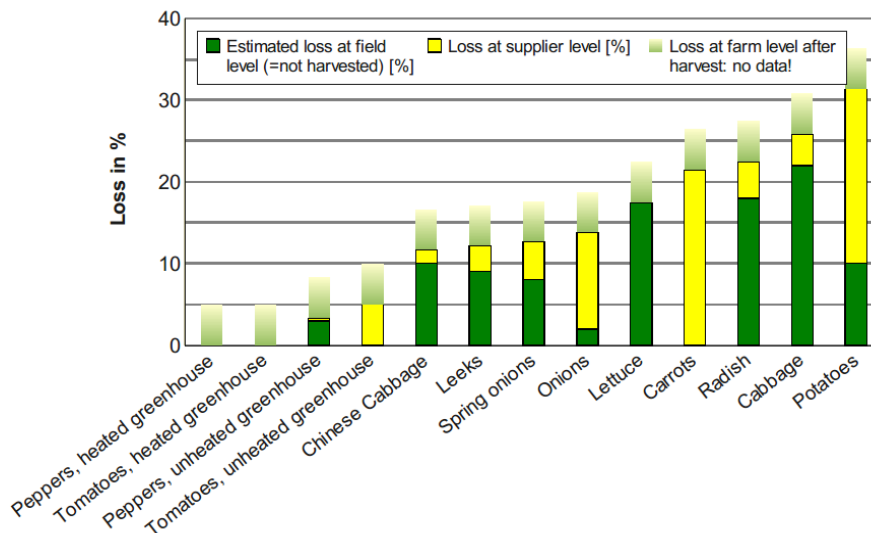


Figure 1: Estimated share of losses at the beginning of the value chain for different vegetables at field level and supplier level

Loss of fruit and vegetables at the beginning of the value chain can occur at different points (1) on the field (product not harvested), (2) at farm level after harvest (product not delivered to supplier), (3) at supplier level (product not delivered to retailer warehouses). Data on loss at farm level after harvest are lacking– probably it is less important than losses at field and supplier level, but certainly some losses occur as well. According to the results of the survey, losses at field level are especially high for salads (iceberg lettuce, butterhead lettuce), cabbage and radish. At supplier level high losses occur for carrots, potatoes and onions. Figure 1 shows estimated loss at field level and supplier level for different vegetables – further losses at farm level after harvest are not known and indicated with transparent columns.

As already applied measures to avoid food waste suppliers mentioned: export of class II products abroad (e.g. for apples), production of juice (apples), deliver products to social markets or food banks. Food waste at supplier level is sometimes used for fodder (carrots), but in most cases it is disposed in biogas plants or returned to farmers for composting. Our survey did not include losses at farm level after harvest. Therefore a direct comparison with data from literature is difficult. In some products 25 % loss – mentioned by Leibetseder (2012) for fruit and vegetables – is exceeded. In others – e.g. greenhouse products – losses seem to be lower.



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## **CONCLUSIONS**

A general problem is the lack of reliable data on product specific food losses at farm and supplier level for industrialised countries. To reduce losses of fruit and vegetables the whole production chain must be considered – including supermarkets and consumers. First ideas how supermarkets can help to reduce losses at farm and supplier level are: lowering visual specifications, improving the supply chain communication to avoid over-production, offering more class II products, selling products such as leek and cabbage per kg, not per piece to avoid the need for extreme uniformity. To be successful, a close cooperation between all stakeholders is necessary. Increasing awareness of food waste and food quality within society could support the implementation and acceptance of those measures in future. Thus, it is important to set initiatives to raise awareness and best practice know-how.

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