Effect of production preparation method on product quality in the fruit farm

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Abstract: Effect of production preparation method on product quality in the fruit farm. Results of survey carried out among the apple producers are presented. The survey concerned the problems of obtaining the proper quality of apples by appropriate actions at the stage of their preparation for market distribution. The investigations showed that one of the most important factors affecting apple quality designed for sale was the lack of knowledge on suitable regulations or their neglectfulness in defiance of existing requirements.

Key words: product quality, market, apples.

INTRODUCTION

Quality is one of the more important priorities that determine effective activity of enterprises producing the food products. With increasing customers’ consciousness regarding the product quality and strong price competition between the food producers and trade nets, maintaining of high standards of food within various understanding of this concept is a challenge.

Luning et al. [2005] presented five discriminants of competitiveness: the first one was quality, and then value, time, flexibility, service reliability. Fruit quality is a factor that determines possibility of selling, therefore, the checking techniques and quality control are subjected to continuous improvement. The ground for competition, apart from characteristic of a given sector, is (among other things) the way of achievement of competitive advantage [Porter 2001]. In turn, high competition level is one of development factors for the entire sector that is especially important in the food products.

Besides, proper quality of offered products that meet the customer’s requirements can facilitate maintaining the trade contacts and results from basic principle of quality management – the customer-orientation [ISO 9000 and 9004]. It is evident from publications [Kotler 2003] that gaining a new customer can be five or ten times more expensive than maintaining the existing one. In majority of fruit farms, due to financial difficulties, the quality management and food safety system is mainly focused on meeting the basic requirements of food law regulations, i.e. application of HACCP principles and good practice (GMP, GHP and GAP). The other problems to be simultaneously developed and improved independently of legal and organizational aspects are problems of appropriate preparation of production. Especially in current market situation characterized by
the supply surplus of food products, the customers are interested in the high-quality products of moderate price. Under conditions of high apple production, the producer’s market has been distinctly transformed into the consumer’s market [Czernyszewicz 2011]. In some measure it confirms the quality definition contained in PN-EN ISO 9001 Standard, namely: “Quality – degree of meeting the needs or expectations by a set of inherent product features”.

Attempts towards distinguishing of feature set as the quality components was successful. It is assumed that the objective and measurable features include mass and shape, while the subjective features (that can be differently evaluated) include colour and smell; there are also some esthetic features [Huber 2007]. However, one should note that food product quality is far more complex than the value of a dead object, since a food product should be not only good-looking and have an esthetic package, but also should be tasty and healthy [Fereniec 1999].

According to Caderek [1986] the quality involves some properties of apples and their advantages, particularly a set of features and physical-mechanical properties as well as usability for consumption, storage, trade turnover and processing. The apple quality definition is also not precise or explicit. According to Jongen [2000] the product quality can be characterized on the basis of its important features; for apples they involve: shape, size of fruits, colour of skin, kind of blush and its size, hardness, taste, colour of flesh and production method, lack of mechanical damage, lack of disease or pest symptoms etc. Constantly growing environmental consciousness of the consumers brings about additional requirements related not only to product itself, but also to its production methods. The features related to production method: amount of pesticides consumed during cultivation or application of biotechnology to modify important fruit properties, affect significantly a series of physical properties of fruits and, first of all, the level of consumers’ acceptance. Chabiera et al. [2000] maintain that unequivocal contractors’ understanding of quality concept is very important in the inland and international trade contacts.

The carried out investigations aimed at determination of the importance of fruit production preparation methods that shape fruit quality with an example of apples.

INVESTIGATIONS AND METHODS

The presented work results were elaborated on the basis of survey carried out among 100 inland apple producers on Agro-Food Wholesale Market in Bronisze SA. The survey form was elaborated with consideration to the trade standard requirements for apples.

The survey’s design aimed at presentation of:
- factors determining the way of apple preparation by producers,
- knowledge of apple distribution into quality grades,
- knowledge of minimal apple sizes and tolerances,
- knowledge of commodity homogeneity.

The producers of various professional experience were investigated: fruit-growers of over 15-year experience (52%),
persons of experience ranged from 5 to 10 years (25%), and persons of experience ranged from 10 to 15 years (15%). The beginners, of experience below 5 years, were in small number (8%). As to the orchard areas, 33% of the producers owned orchards of area ranged from 5 to 10 ha, 26% of producers owned orchards of area ranged from 10 to 15 ha. The large orchards above 20 ha belonged to 11% of producers, and 13% of investigated persons owned orchards of area up to 5 ha.

RESULTS OF INVESTIGATIONS

According to Decree of Commission (WE) 1580/2007, from 1st July, 2009 the fresh vegetable and fruits introduced to trade turnover in EU are subjected to the trade standard requirements. There are ten detailed trade standards for the key species of fresh vegetables and fruits, including apples. The trade standard determines a series of apple properties to be considered in fruit classification into particular quality grades. It is evident from investigations that the producers take into account these properties in various ways (Fig. 1). The size is most often taken into account (88%), however, this property has no scale according to standard, since only one minimal size for all grades is required. Similar result was obtained for the fruit colour (76%).

Less consideration of fruit growers was paid to other properties: fruit damage (49% of respondents), rustiness (48%) and cleanliness (44%), then damage by pests (40%), shape (36%), degree of ripeness (35%), presence of pests (32%). Presence of foreign taste and smell was pointed out by 24% of respondents only, while the intact condition of stalk by 13%; one should note that only apples with undamaged stalk can be classified

![Image](image_url)

FIGURE 1. Apple properties determining classification into quality grades according to producers (% of indications)
as grade “extra”. The fruit moistening got the lowest score.

The apple size is clearly determined by the trade standard. According to standard’s requirement the minimal apple size admitted to trade turnover is equal to 60 mm (diameter) or 90 g (mass) for all quality grades. The investigations point out that only 59% of respondents allow the fruit for trade turnover according to requirements (Fig. 2), while 35% of investigated persons point out that minimal dimensions amount to 55 mm (diameter) or 80 g (mass); 6% of producers accept even smaller fruits.

The trade standard permits to trade turnover the apples smaller than 60 mm or 90 g; it is possible if extract content exceeds 10.5° Brix and minimal apple diameter amounts to 50 mm. It is evident from carried out investigations that only every other respondent knows about trade turnover of smaller fruits (Fig. 3), while 47% of fruit producers do not know about that; this indicates the problem importance.

According to obligatory regulations, there is some size tolerance in all apple quality grades; every package unit can contain 10% (by number or mass) of fruits that do not meet the minimal size requirements. This concerns the fruits of size lower by 5 mm or 10 g than minimal diameter or mass, respectively. Only 52% of respondents new about such tolerance (Fig. 4), while for 45% of them the tolerance amounted to 5%, and 3% pointed out at value of 15%.

![FIGURE 2. Minimal size of apples allowed for trade turnover according to producers](image1)

![FIGURE 3. Possibility of admission of smaller fruits to trade turnover according to producers](image2)

![FIGURE 4. Fruit producers’ knowledge of admissible tolerance in apple size](image3)
According to requirements of the trade standard, a separate package should contain fruits of the same origin, species, size, quality and ripeness. Besides, the apples of “extra” grade should have the same colour. It is evident from carried out investigations that the producers do not know about this (Fig. 5). Significant majority of fruit producers (75%) put fruits of the same variety in a separate package. The size, quality and origin of fruits during their preparation for sale is considered by 62%, 48% and 46% of producers, respectively; this can point out at significant abnormality in the ways of fruit preparation. Only 19% of respondents considered during fruit packing the same colour requirement; it is obligatory for “extra” grade apples.

The fruit transport process significantly affects their quality. The use of improper packages, careless and improper preparation of fruits can lead to fruit damages and deterioration of their properties. It was found during investigations, that almost all producers put old newspapers into boxes for the apples meant for sales. The used boxes were worn out in various ways and dirty, while the newspapers (that should not be used for this purpose because of contamination with printing-ink) had also signs of other contaminants. The wooden packages do not sufficiently protect the product against damage with respect to their rigidity, rough surface and difficulties in clearing; such packages are not allowed by the standard. The producers are aware that this form of package deteriorates the fruit quality and their esthetic advantages and also makes transport difficult. However, it was found that the main hindrance in the replacement of old packages with the proper ones is their high price and necessity of additional costs. Besides, at the lack of uniform package form the fruit market suppliers that want to recover their packages should repack fruits into the receiver’s packages.

According to the standard, every package should have a label with product and producer specifications. This requirement is not observed, although it is important from the viewpoint of food safety and possibility of quick identification of the supplier. Only 36% of respondents declared application of labeling of the product designed for sales; it pointed out at relatively low level of observing the obligatory regulations by the producers. The trade standard very precisely determines information to be put on a package. All the investigated fruit producers that use the product labeling put on the label information on variety, species and
quality grade (Fig. 6). Slightly less (97%) of respondents put information on country of origin, fruit size (91%), net weight (87%), name, address of packer or sender (77%), diameter or maximal and minimal weight (64%). However, information on cultivation region, number of fruits in the package and official control sign are put only by small percent of respondents.

The results of investigations presented above concern the selected components of a general quality problems of fruits that occur on the market. Very often the effects of many efforts towards following the requirements of fruit production technology in the form of good fruits are annihilated at the stage of fruit preparation for trade turnover. The investigations show that not all apple producers are aware of the fact that their product not conforms to the requirements of suitable regulations. The producers’ opinions on trade quality of Polish apples differ (Fig. 7).

Almost 73% of respondents think that Polish apples are characterized by very good or good trade quality, when compared to imported apples. 18% of respondents recognize this quality as satisfactory, and only 9% of producers as bad. It is favourable that 83% of fruit producers want to undertake further activity towards quality improvement of produced apples.

![FIGURE 6. Information placed by producers on a label (% of indications)](image1)

![FIGURE 7. Quality of Polish apples according to producers (% of indications)](image2)
CONCLUSIONS

1. The trade standard determines a series of apple properties that should be considered in qualitative evaluation of fruits. It is evident from investigations that these properties are variously taken into consideration by the producers.

2. The apple size is most often considered by the producers, although this property is not important when the fruits are divided into quality grades.

3. One of the reasons for quality deterioration of fruits that occur on the market is substantial differentiation within the same package with respect to origin, variety, size, quality and ripeness degree.

4. An important factor that affects the fruit quality is application of proper packages. The significant percentage of producers use the improper and incorrectly labeled packages.

5. It is favourable that 83% of fruit producers want to undertake further activity towards quality improvement of produced apples.

REFERENCES


