

Is the Quality of Fruits in the Market Responding to the Minimum Requirements of the QS of EU?

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Keywords: Quality, peaches, pears, apples, apricots,

Abstract

In this paper the data collected from three Italian mega stores of Viterbo (Rome area) from different types of fruit (peaches, apricots, apples and pears) purchased twice in the same season are presented. Fruit quality was compared to the minimum EU quality standard requirements. The fruits were kept in a laboratory simulating the usual conditions in the market. All fruit met the EU quality standards only for size. Not all the fruit met the UE quality standards related to the category assigned from the mega store, for freshness, appearance, shape, integrity, and colour uniformity. Only apples in one mega store responded to all the EU quality standards. No relationship existed between the assigned category, the quality and the price of the product. Since fruits were kept in non-refrigerated bulk display, the recorded temperature varied between 20-25°C with R.H. varying from 40 to 50%. The conditions during simulated laboratory storage were 20°C and 65% R.H. despite these better thermohygrometric conditions, in terms of firmness and overall quality, fruit quality decreased in 8 hours, from the morning to the evening. Apples and pears lost firmness quickly during the day especially during the first purchase.

INTRODUCTION

Consumption of fruit and vegetables have increased about 5% from the year 2000 to 2001 with the consumer always keeping an eye to the quality of the offered product (Della Casa, 2002).

According to a recent poll conducted on 7 grocery distribution chains in Italy, (Manicardi, 2000) the market segment, dedicated to fresh products represents an average of 25% but sometimes up to 36% of the whole market. From this, one can clearly see the importance of the fresh fruit and vegetable market and the added value that can perhaps affect the entire food market. Since, most of the Italian mega stores present fresh produce in isolated areas without any temperature control, doubts arose on the daily quality of the product.

The results presented here are related to samplings conducted on fruit types most commonly purchased in 3 mega stores in Viterbo. This focuses on peaches, apricots, pears and apples.

MATERIAL AND METHODS

A Rotronic HygroWin A1.model was used to measure the R.H. and temperature of the environment where the products were presented to the public. Also noted for all these stores were variety, when indicated, assigned category, size, provenience, price per kg and date and hour of sale.

Two different purchases (40 pieces of fruit per sale) with a difference of 10 days were made. In the mega stores, none of the purchased fruits were kept in refrigerated displays.

Immediately after the purchase, the fruits were brought to the laboratory where they were subjected to an accurate quality control and compared with the E.U. standard quality. In particular, the fruits were examined for the freshness, cleanliness, shape, and uniform colour.

The calibration was carried out using a stainless steel Fimec Caliper which

measures the fruit diameter.

For each examined characteristic, the percentage of fruits which, corresponded to the E.U. standards for the mega stores was scored.

Flesh firmness was measured using a penetrometer, pressing an 8 mm diameter cylinder in the equatorial zone of the fruit after the peel removal.

RESULTS AND DISCUSSION

In tables 1, 2, 3 and 4 we can see how most of the fruit did not match the EU quality standards. Only apples in one mega store responded to most of the quality standards. No relationship was found between price and category. The applied thermohygrometric conditions were unable to maintain good quality of the product. In some cases fruit appearance changed completely, but above all the firmness decreased. In figures 1, 2, 3 and 4, the decrease in firmness between the analysis performed in the morning and that one conducted in the evening is shown. In figure 1 the apples of the 1st purchase lost from 30 to 50% of the initial firmness while at the 2nd purchase the loss was only 2-8%. Figure 2 shows a 56% firmness decrease for the first pear sample at mega store 2. We expected a large firmness decrease because pears require a quite long period at low temperature to start the softening process (Gerasopoulos and Richardson, 1997). In fig 3 firmness decrease for peaches is reported. The second sampling in the first mega store does not show any firmness decrease, while in the other 2 stores the firmness decrease ranged between 5 and 13%. Regarding the apricots (Fig.4) of the first purchase in the second mega store, firmness loss was of 18% while only 5% for the second purchase. Apricots purchased at the remaining mega store showed a firmness loss between 10 and 13%.

Another worrying aspect is that the quality is already low when the fruit is displayed as can be taken from the Tables 1, 2, 3 and 4. Already in the same morning the fruit were purchased, characteristics such as appearance, freshness, shape, uniform colour, did not match the EU quality standards for that particular product. This means that professionalism and care in the handling system is very low. In the case of Apples, where the fruit that has the highest technology and money input in the handling system, scored better.

CONCLUSIONS

Referring to the specific mega grocery stores and specific products, apparently very little attention is given to quality assurance. The consumer is offered a product not complying to the assigned category, and with an inappropriate price. Herregods (1993) reported that the product's price depends on the quality offered, the specific day of the week and the region of origin. Many other factors affect the quality such as product loss, season, and the distribution chain. Finally, we want to point out the importance of the conditions of the visual display in the supermarkets.

Literature Cited

- Della Casa R., (2002). Il quadro dei consumi in Italia: l'incremento è solamente in valore. *Mark up*, IX, 92, 4-7.
- Herregods M., (1993). Profitable quality: cost and profits concerning marketing a product preferred by consumer. *Comunicazione personale*.
- Gerasopoulos D. and Richardson D.G. (1997). Ethylene production by "d'Anjou" pears during storage at chilling and non-chilling temperatures. *Postharvest Biology and Technology* 32, 1092:1094.
- Manicardi A., (2000). I reparti dei freschi fanno l'immagine all'Iper. *Mark up*, VII, 75, 20-23.

Tables

Table 1. Quality characteristics of apricots of two purchases in 3 different mega stores compared with the EU quality standards. It is also reported the category assigned by the mega store. With “x” mark it is shown when the EU quality standard is matched

| Category | Mega store | | | | | | | | | | | |
|-------------------------|------------|------|------|------|------|------|------|------|------|------|--------|--|
| | 1 | | 2 | | | | 3 | | | | | |
| | I | II | II | II | I | II | % | EU | % | EU | | |
| | % | EU | % | EU | % | EU | % | EU | % | EU | | |
| Whole Fruit | 80 | | 86 | | 79 | | 53 | | 71 | | 72 | |
| Fresh Appearance | 90 | x | 86 | | 50 | | 27 | | 86 | | 56 | |
| Sound | 80 | | 71 | | 71 | | 47 | | 86 | | 67 | |
| Cleaned | 100 | x | 100 | x | 100 | x | 60 | | 100 | x | 83 | |
| Well formed | 70 | | 71 | | 57 | | 67 | | 86 | | 89 x | |
| Uniform colour | 90 | x | 86 | | 93 | x | 53 | | 86 | | 83 | |
| Caliper (mm) | 54,4 | x | 45 | x | 50 | x | 42,3 | x | 44,7 | x | 50,5 x | |
| Price per Kg (€) | | 3,00 | | 2,00 | | 2,00 | | 2,00 | | 1,95 | 1,95 | |
| Temperature (°C) | 24.2 | | 26 | | 25.6 | | 27.2 | | 26.9 | | 25.9 | |
| R.H. (%) | 41.7 | | 36.2 | | 37.5 | | 38.7 | | 41.0 | | 39.8 | |

Table 2. Quality characteristics of peaches of two purchases in 3 different mega stores compared with the EU quality standards. It is also reported the category assigned by the mega store. With “x” mark it is shown when the EU quality standard is matched

| Category | Mega store | | | | | | | | | | | |
|-------------------------|------------|------|------|------|------|------|------|------|------|------|--------|--|
| | 1 | | 2 | | | | 3 | | | | | |
| | I | II | II | II | I | II | % | EU | % | EU | | |
| | % | EU | % | EU | % | EU | % | EU | % | EU | | |
| Whole Fruit | 86 | | 83 | | 93 | x | 62 | | 71 | | 82 | |
| Fresh Appearance | 71 | | 75 | | 57 | | 38 | | 64 | | 73 | |
| Sound | 64 | | 83 | | 71 | | 69 | | 71 | | 91 x | |
| Cleaned | 86 | | 83 | | 79 | | 38 | | 93 | x | 73 | |
| Well formed | 93 | x | 92 | x | 93 | x | 75 | | 100 | X | 91 x | |
| Uniform colour | 86 | | 83 | | 71 | | 86 | | 93 | x | 73 | |
| Caliper (mm) | 65,7 | x | 67,5 | x | 63.8 | x | 66.8 | x | 71.2 | x | 72.2 x | |
| Price per Kg (€) | | 2,00 | | 2,00 | | 1.45 | | 1.30 | | 2.00 | 2.00 | |
| Temperature (°C) | 26 | | 25.7 | | 27.2 | | 26.2 | | 25.9 | | 24.7 | |
| R.H. (%) | 36.2 | | 44.0 | | 38.7 | | 37.5 | | 39.8 | | 44.2 | |

Table 3. Quality characteristics of apples of two purchases in 3 different mega stores compared with the EU quality standards. It is also reported the category assigned by the mega store. With “x” mark it is shown when the EU quality standard is matched

| Category | Mega store | | | | | | | | | | | |
|-------------------------|------------|------|------|------|------|------|------|------|------|------|------|------|
| | 1 | | | | 2 | | | | 3 | | | |
| | I | | II | | II | | II | | I | | II | |
| | % | EU | % | EU | % | EU | % | EU | % | EU | % | EU |
| Whole Fruit | 91 | x | 80 | | 100 | x | 84 | | 100 | x | 84 | |
| Fresh Appearance | 64 | | 60 | | 58 | | 50 | | 100 | x | 67 | |
| Sound | 91 | x | 80 | | 100 | x | 75 | | 92 | x | 84 | |
| Cleaned | 91 | x | 90 | x | 92 | x | 84 | | 100 | x | 92 | x |
| Well formed | 73 | | 80 | | 92 | x | 92 | x | 92 | x | 84 | |
| Uniform colour | 82 | | 70 | | 84 | | 92 | x | 100 | x | 67 | |
| Caliper (mm) | 69.6 | x | 79.6 | x | 74.9 | x | 79.2 | x | 79.7 | x | 85.8 | x |
| Price per Kg (€) | | 1.50 | | 1.50 | | 1.40 | | 1.50 | | 1.70 | | 1.45 |
| Temperature (°C) | 23.9 | | 23.3 | | 23.0 | | 21.3 | | 22.3 | | 22.6 | |
| R.H. (%) | 52.0 | | 40.4 | | 56.2 | | 46.5 | | 54.7 | | 43.2 | |

Table 4. Quality characteristics of pears of two purchases in 3 different mega stores compared with the EU quality standards. It is also reported the category assigned by the mega store. With “x” mark it is shown when the EU quality standard is matched

| Category | Mega store | | | | | | | | | | | |
|-------------------------|------------|------|------|------|------|------|------|------|------|------|------|------|
| | 1 | | | | 2 | | | | 3 | | | |
| | I | | II | | II | | II | | I | | II | |
| | % | EU | % | EU | % | EU | % | EU | % | EU | % | EU |
| Whole Fruit | 92 | x | 58 | | 67 | | 42 | | 83 | | 58 | |
| Fresh Appearance | 67 | | 50 | | 58 | | 67 | | 83 | | 42 | |
| Sound | 75 | | 50 | | 58 | | 67 | | 67 | | 67 | |
| Cleaned | 67 | | 67 | | 58 | | 83 | | 83 | | 67 | |
| Well formed | 83 | | 58 | | 75 | | 83 | | 92 | x | 75 | |
| Uniform colour | 92 | x | 67 | | 83 | | 75 | | 83 | | 67 | |
| Caliper (mm) | 62.5 | x | 65.7 | x | 62.2 | x | 67.4 | x | 51.8 | x | 65.3 | x |
| Price per Kg (€) | | 1.65 | | 1.65 | | 1.70 | | 1.70 | | 1.70 | | 2.00 |
| Temperature (°C) | 23.9 | | 23.3 | | 23.0 | | 21.3 | | 22.3 | | 22.6 | |
| R.H. (%) | 52.0 | | 40.4 | | 56.2 | | 46.5 | | 54.7 | | 43.2 | |

Figures

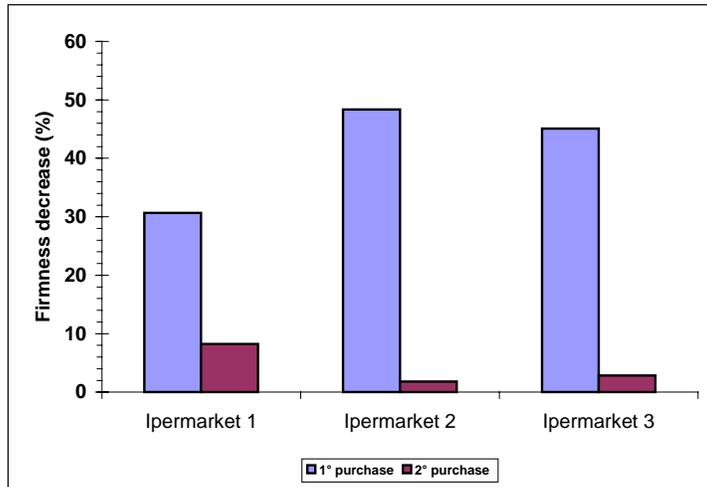


Fig. 1. Firmness decrease (%) in apples from the morning until the evening during the simulation of retail maintenance. Data represent the average of 30 fruits per each purchase

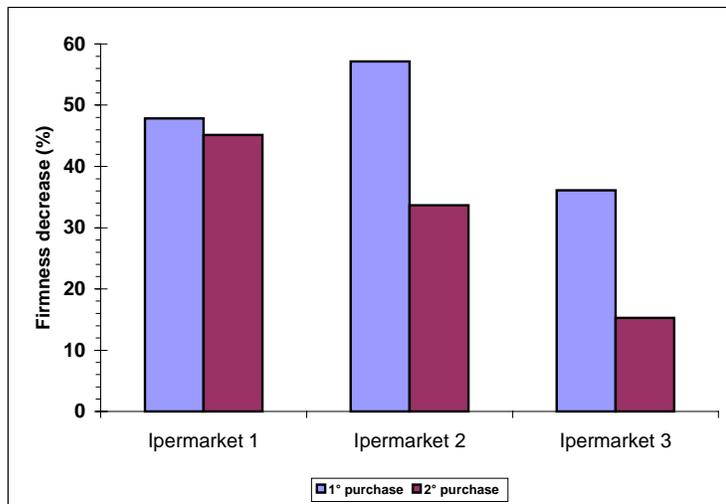


Fig. 2. Firmness decrease (%) in pears from the morning until the evening during the simulation of retail maintenance. Data represent the average of 30 fruits per each purchase

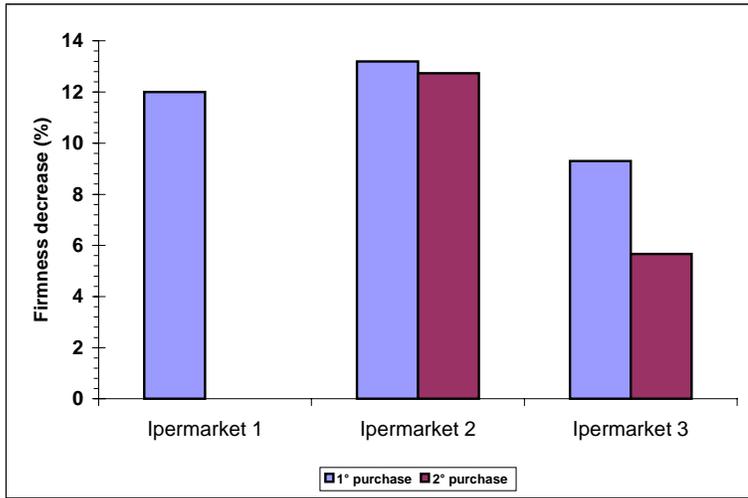


Fig. 3. Firmness decrease (%) in peaches from the morning until the evening during the simulation of retail maintenance. Data represent the average of 30 fruits per each purchase

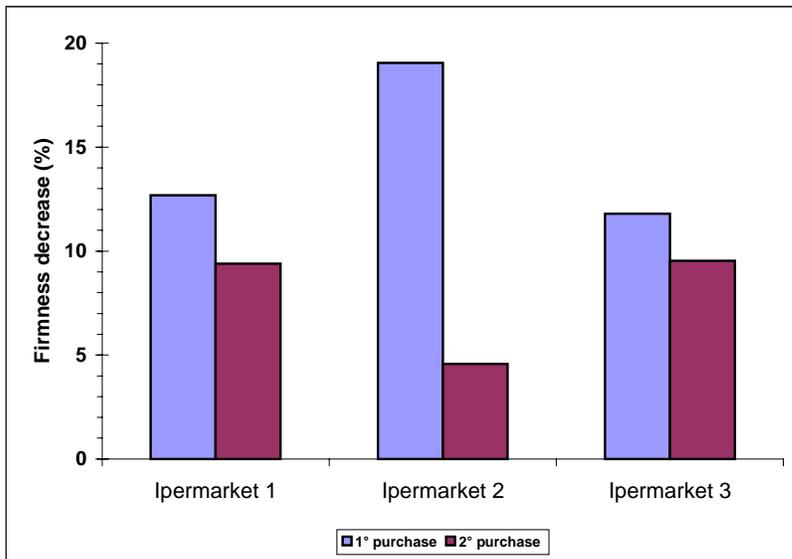


Fig. 4. Firmness decrease (%) in apricots from the morning until the evening during the simulation of retail maintenance. Data represent the average of 30 fruits per each purchase