Relationship between Instrumental and Sensory Quality Parameters of Various Pear Varieties

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INTRODUCTION

Instrumental measurement of pear colour and firmness is a common practice for the assessment of its quality performed by producers, distributors and retailers. However, product quality should also be evaluated in terms of consumer – oriented attributes – in fact, technological developments and innovations that consumers can not fully perceive have little, or no impact at all on the market.

MATERIALS AND METHODS

Three varieties of pears: · *'Rocha'*, · *'Red Anjou'* and · '*Blanquilla*' were obtained at commercial maturity and subjected to an

Instrumental analysis: · *Firmness* (puncture test, using a probe ∅ = 8 mm and load cell = 100 N) and · *Color (Hunter system L*a*b*)*

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Sensorial assessment: · *Yellow color* · *Firmness* · *Sweetness and* · *Juiciness* intensity were evaluated for each variety of pears 3 times by 8 panellist using an 1–9 anchored scale were 1 = none, 5 = moderately and 9 = extremely intense

Statistical analysis:

Instrumental and sensorial analyses were subjected to an analysis of variance (ANOVA) and significant differences ($P = 0.05$) were detected (Tukey test) using SPSS v. 11.5. The difference above which the panel could detect sensorial variation was calculated as described by Harker *et al*. (2002).

RESULTS

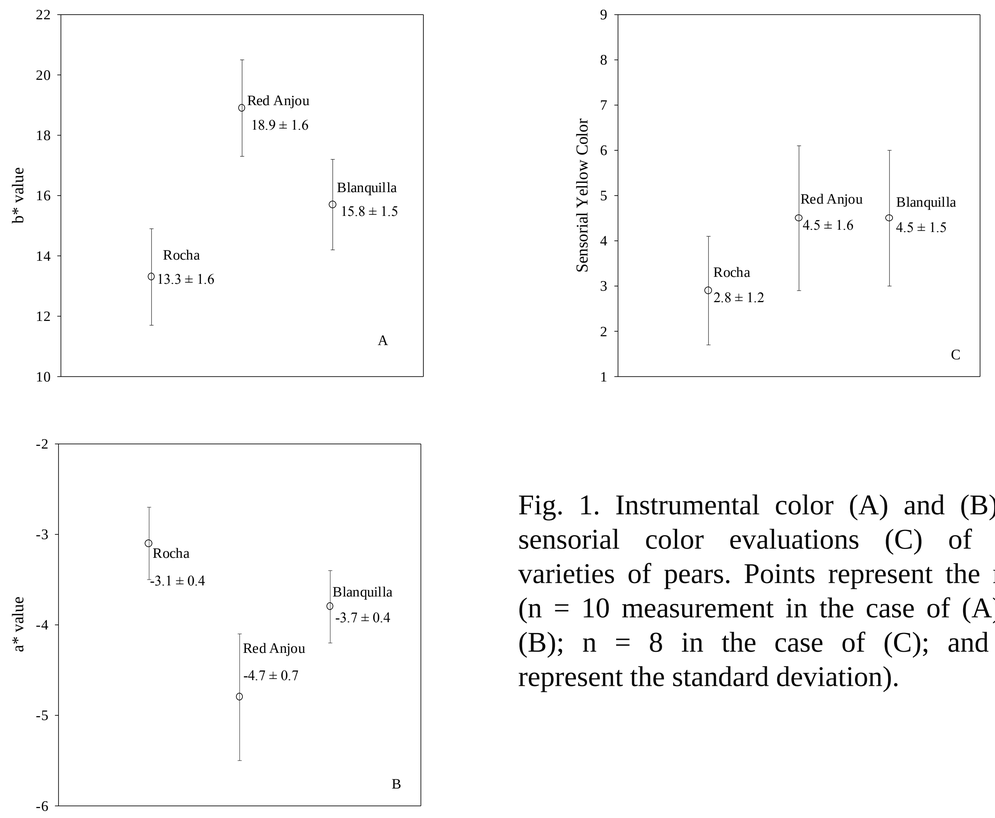

Fig. 1. Instrumental color (A) and (B) and sensorial color evaluations (C) of three varieties of pears. Points represent the mean (n = 10 measurement in the case of (A) and (B); n = 8 in the case of (C); and bars represent the standard deviation).

- The three varieties of pears were instrumentally differentiated from each other in terms of Hunters a* and b*
- Hunter's b* value showed that 'Rocha' pears presented the lowest b* values (Fig. 1A). 'Red Anjou' presented higher b* values than 'Blanquilla' and 'Rocha' pears.
- 'Red Anjou' pears were characterized with the lowest Hunter's a* values (Fig 1B). 'Rocha' pears had higher a* values than 'Blanquilla' and 'Red Anjou' ones.
- The panellists could detect differences in terms of yellow color. The 'Red Anjou' and 'Blanquilla' pears were evaluated more yellow than the 'Rocha' ones (Fig. 1C).

RESULTS

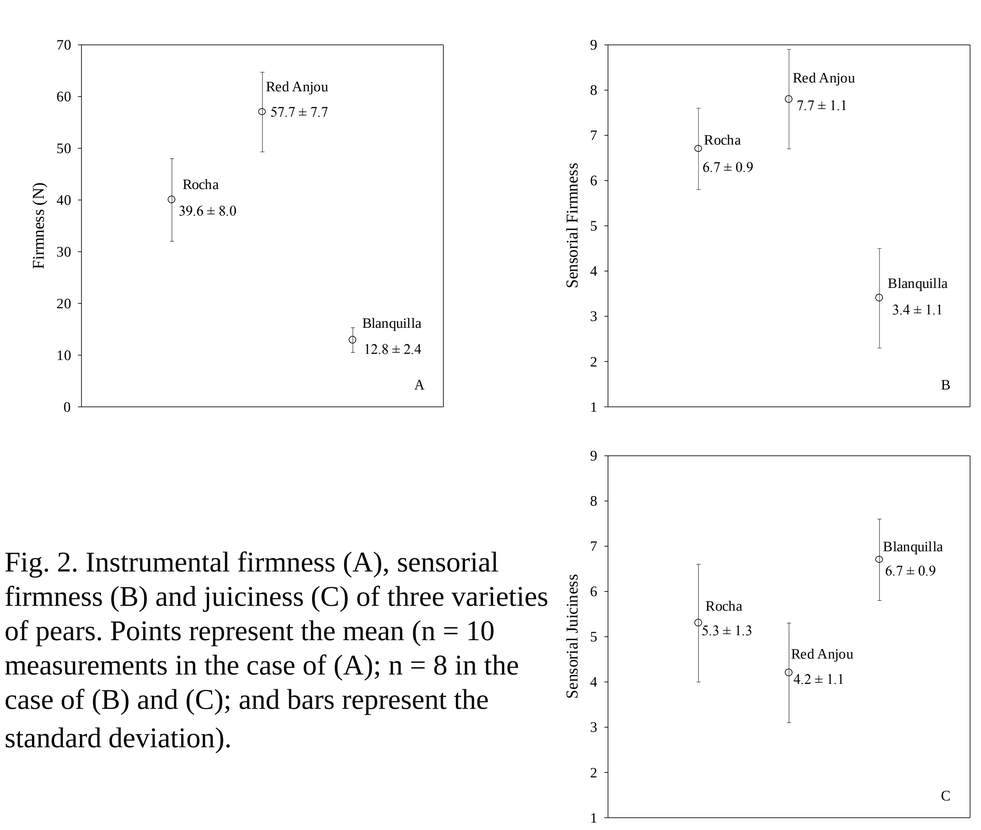

Fig. 2. Instrumental firmness (A), sensorial firmness (B) and juiciness (C) of three varieties of pears. Points represent the mean (n = 10 measurements in the case of (A); n = 8 in the case of (B) and (C); and bars represent the standard deviation).

- Significant differences were detected in terms of instrumental firmness between the different varieties of pears (Fig. 2A). 'Red d' Anjou' pears were detected as the firmest ones.
- In terms of sensorial firmness, 'Blanquilla' pears were evaluated with the lowest firmness. The 'Red Anjou' pears were the firmest (Fig. 2B).
- 'Red Anjou' pears were evaluated with the lowest juiciness and the most juicy were 'Blanquilla' pears (Fig 2C).

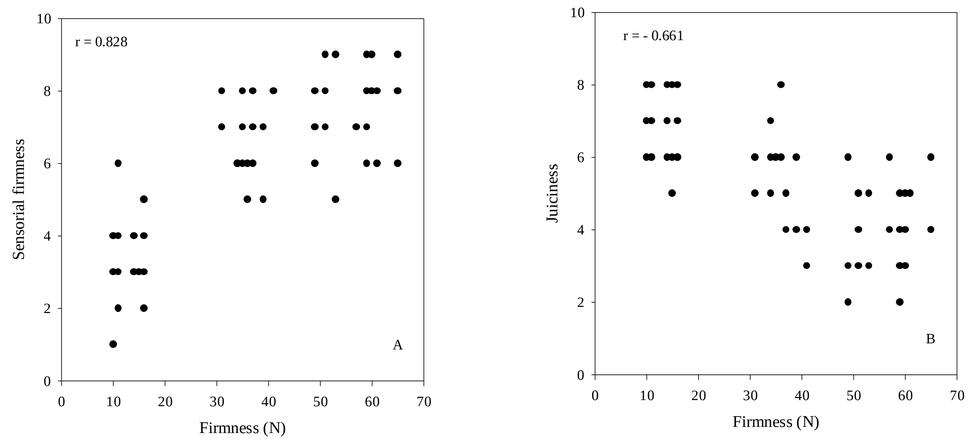

Fig. 3. Relationship between instrumental firmness and sensorial firmness (A) and juiciness (B). Points represent the score by individual panellist for a single pear.

- The instrumental firmness had a strong correlation with the sensorial firmness with a correlation coefficient of r = 0.83 and also with juiciness r = -0.661 (Figs. 3A and B).
- Hunter's b* value had a good correlation with the sensorial evaluation of yellow colour (Pearson correlation coefficient of 0.41).
- The difference in the puncture force required before the panellist would detect a difference, based on a 95% probability, in the sensorial firmness was 31 N; and a greater difference was required to cause a detectable difference in juiciness.

CONCLUSION

A clear relationship was found between instrumental firmness, on the one hand, and sensory firmness and juiciness, on the other.

Reference: Harker, F. R., Maindonald, J., Murray, S. H., Gunson, F. A., Hallett, I. C. and Walker, S. B. 2002. Sensory interpretation of instrumental measurements 1: texture of apple fruit. *Postharvest Biology and Technology* **24:** 225-239.

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