Snap bean \((Phaseolus vulgaris\ L.)\) quality profile by sensory descriptive analysis

by Mar VILANOVA, Paula RODIÑO, Ana GONZÁLEZ, Pilar CANOSA, Iria RODRÍGUEZ-VEGA, Manuel RIVEIRO and Marta SANTALLA*

Abstract: Sensory quality of snap beans \((Phaseolus vulgaris\ L.)\) influence consumer preferences. The application of sensory descriptive analysis (SDA) for snap bean quality is shown in this work. SDA has allowed generating descriptors for appearance, aroma, flavor and texture, which could be used to characterize snap bean varieties.

Key words: sensory quality, common bean, quality, Phaseolus vulgaris.

Importance of sensory descriptive analysis in food quality

Sensory quality is the ultimate measure of product quality. Sensory analysis comprises a variety of powerful and sensitive tools to measure human responses to foods. Specific scientific methods have been developed to accurately, reproducibly and objectively measure or estimate human responses to stimuli. All descriptive analysis methods involve the detection and the description of both qualitative and quantitative sensory aspects of a product by a trained panel. Panelist must be able to detect and describe the perceived sensory attributes of a sample, appearance, aroma, flavor, texture or sound properties and they must learn to differentiate and rate the intensity of these descriptors.

The flavor profile method (FMP) was the first reported descriptive method, developed in the 1940s to complement existing sensory techniques. FMP is a consensus technique, and vocabulary development and rating sessions are carried out during group discussions, with members considering aspects of the detectable flavor components (5). Quantitative descriptive analysis (QDA) was developed during the 1970s and it has gained acceptance for sensory evaluation (8). QDA is one of the most comprehensive and informative tools used in sensory analysis for evaluating food and dairy products (8). The principle of QDA is based on the ability to panelists to measure specific attributes of a product in a reproducible manner to yield a comprehensive quantitative product description amenable to statistical analyses (2).

Snap bean quality by sensory descriptive analysis

Sensory Descriptive Analysis has been applied in the last years to evaluate bean quality (4, 7). QDA was applied to know the gamma radiation effect on sensory attributes of the common bean \((Phaseolus vulgaris\ L.)\) variety Carioca Tybatá from Brazil (1). Other authors have also applied SDA to correlate the sensory descriptors with volatile compounds in rehydrated French beans (9), and to evaluate the sensory characteristics of local varieties of common bean from Cuba (4) and Spain (7).

A study of 10 snap bean varieties by sensory descriptive analysis, including both fresh and cooked immature pods, was carried out in the MBG-CSIC. A selection of descriptors to evaluate the snap bean quality profile was identified by a panel (Figure 1), according to the motivation (all volunteers) and availability (attendance at all sessions). Sessions were carried out by following the NORME ISO 11035 (6). The Geometric Mean (GM) permitted to take into account descriptors which were rarely mentioned, albeit very important in terms of the perceived intensity, and those descriptors perceived with a low intensity but nevertheless often mentioned in the analysis (3).
Acknowledgments

This work has been funded by a grant 09MRU025403PR of the Galicia Government. A. Paula Rodinño, Ana M. González were supported by a research contract of the Xunta de Galicia and National Spanish Research Council (CSIC), respectively. I. Rodríguez-Vega and P. Canosa thanks grants to Spanish Government.

References

(3) Dravnieks A, Bock FC (1978). Comparison of odours directly and through proWling (ITT Research Institute, Chicago, IL 60610). Chem Sence Flavour 3:36–54
(6) Norme ISO 11035 (1994) Sensory analysis. Identification and selection of descriptors for establishing a sensory profile by a multidimensional approach

Figure 1. Sensory descriptors for snap bean quality profile, according to a scale from 0 to 9

VIUSUAL AND TOUCH DESCRIPTORS

Color/Appearance

Touch

1) Intensity
2) Uniformity
3) Secondary color (red)
4) Secondary color (violet)
5) Rugosity

1) Rugosity
2) Hardness
3) Elasticity

OLFATORY DESCRIPTORS

Aroma

1) Intensity
2) Quality
3) Floral
4) Fruity
5) Metal
6) Nuts
7) Mushroom
8) Potato

TASTE DESCRIPTORS

Flavor

Texture

1) Quality
2) Intensity
3) Sweet
4) Salt
5) Acid
6) Bitter

1) Hardness
2) Woodiness
3) Granular
4) Fondant
5) Crisp
6) Astringent