

## Establishing tenderness threshold of beef using instrumental and consumer sensory evaluation

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The consumers consider tenderness one of the most important qualitative characteristics of meat, so they are willing to pay a higher price for beef as long it is guaranteed tender. However, tenderness is also a highly variable property, depending on many intrinsic and extrinsic factors, such as animal breed, feed, and management, and on their interaction. Establishing a tenderness threshold could serve as a precise quality control system to guarantee tender meat and to assure consumer acceptability. A threshold is defined as a point on the sensory stimulus scale at which a transition occurs in a series of sensations or judgements. The present study aims to establish a tenderness threshold for beef steaks using a consumer sensory test. About 250 consumers were asked to rate consumption frequency, mode of preparation, and their palatability of beef. Consumers were further asked to assess which tenderness category was most appropriate for each one of four beef samples of commercial origin, considering an affective acceptance test through a 5-category hedonic scale (Very Hard, Hard, Ideal Tenderness, Tender and Very Tender). The same beef samples were evaluated through Warner-Bratzler shear force (WBSF) and texture profile analysis (TPA) to define their instrumental tenderness. The results obtained allowed us to conclude that there is a correlation between the sensory and instrumental evaluation of beef tenderness. However, a correct definition of the threshold must always consider both instrumental evaluation methods, WBSF and TPA. A tender meat should have shear force values between 15 and 32N and a compression force between 11 and 20N, while a hard meat should have a shear force greater than 37N and a compression force greater than 30N. Both instrumental tests give different information: WBSF test evaluates the meat fibres perpendicularly, as do incisor teeth, while TPA mimics the chewing with molar teeth. It is not possible to discard one of the instrumental tests, if the aim is to correlate beef measured tenderness with its sensory evaluation.

Work supported by the project PDR2020-1.0.1-FEADER-030803, co-funded through ERDF, COMPETE, POFC, and national funds through FCT/MCTES under project UIDB/05183/2020 (MED).