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Using Blunted Versions of the Meullenet-Owens Razor Shear Method for Assessing Poultry Meat Texture

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Objectives

The objective of this study was to evaluate the use of blunt versions of MORS to instrumentally assess meat texture. Consumer perception of texture is a recent concern within the poultry industry due to multiple factors including common shortened aging periods and breast myopathies. Woody breast (WB) is a myopathy characterized by a distinct hardness of the raw fillet and is associated with increased collagen due to infiltration after muscle fiber degeneration. The Meullenet-Owens Razor Shear (MORS) method is a common method for indirectly assessing poultry meat tenderness. It has similar ability to predict meat tenderness as Allo-Kramer and Warner-Bratzler methods, but it requires less sample preparation as a intact fillet can be sheared. Because WB texture is complex, MORS has not always been associated with those texture changes. A blunt version of the MORS (BMORS) has been shown to be a more sensitive method at higher degrees of toughness. Both the MORS and BMORS use a disposable blade. A slightly larger stainless steel incisor blunt blade may offer probe longevity and may be useful in assessing tough meat with or without WB characteristics.

Materials and Methods

Breast fillets were deboned from broiler carcasses at 0.5 h postmortem (PM) and aged on ice in a 4°C cooler overnight. Fillets were scored for severity of WB and were placed into 2 categories, normal (NORM) and mild woody breast (WB) in 2 replications. Breast fillets (n = 48; 24 per category) were cooked to 76°C, cooled to 4°C, and sheared using MORS (8.9 mm wide, steel razor straight edge; TA-45), BMORS (8.9 mm wide, 0.5 mm thick steel blunt edge), and an incisor blade (IMORS; 11 mm wide, 1.5 mm thick stainless steel blunt edge; TA-46) on the TA.XT Plus Texture Analyzer (Texture Technologies, Corp.). Total energy and force were measured and data was subjected to ANOVA. The main effects were method type and WB category.

Results

There was a method by WB category interaction (P < 0.05). For NORM and WB fillets, the IMORS was significantly higher (P < 0.05) than the BMORS which was significantly higher (P < 0.05) than MORS for total energy and force. However, the differences due to method were greater in the WB fillets; the total energy and force for IMORS and BMORS were higher (P < 0.05) in WB than in NORM, but there was no difference (P > 0.05) due to WB category for the MORS energy and force. The higher energy and force values in the IMORS and BMORS are likely related to the mechanisms related to increased hardness of the fillets and the use of compression in the blunted versions of shearing which is essentially absent in the MORS method due to the razor edge. This suggests that the blunted versions of MORS are better at distinguishing differences in texture due to WB. The MORS was highly correlated to BMORS (r = 0.7) while only moderately correlated to IMORS (r = 0.5) for either energy or force. The difference in correlation was likely due to the thickness of the blades used. The BMORS and IMORS were highly correlated (r = 0.8) to each other likely due to the blunted aspect of the method.

Conclusion

In conclusion, the results of this study suggest that the blunted versions of MORS may be useful in assessing meat tenderness and distinguishing differences due to WB. However, future research is needed to assess these methods over a wider range of data including traditionally tough and tender meat along with varying degrees of woody breast.

