

THE RELATIONSHIP OF CHEMICALLY DETERMINED FAT IN THE TENTH RIB EYE MUSCLE TO VISUAL MARBLING SCORE AND FAT THICKNESS

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Chiller assessment of beef carcasses in Australia includes a subjectively determined marbling score. This paper examines the accuracy and reliability of visual marbling score relative to chemically determined marbling fat and fat thickness measurements. Rump P_8 fat thickness (P_8) and 12th rib fat thickness (FT_{12}) were measured in 132 Santa Gertrudis steer carcasses. A one-centimeter thickness of *M. longissimus* at the 10th rib was trimmed of external fat and its intramuscular fat was determined by ether extraction. The AUS-MEAT Chiller Assessor's marbling scores were noted. Correlation and regression analyses were used to study the relationship between chemical fat on one hand, and P_8 , FT_{12} and visual marbling score on the other. Figure 1 and the two equations show these relationships.

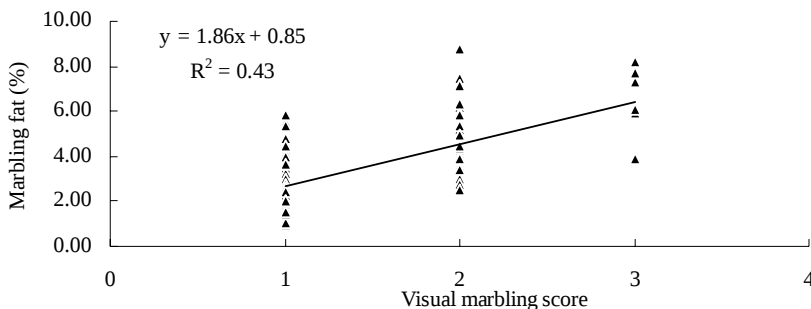


Figure 1. Relationship of chemical fat to visual marbling score

$$\text{Chemical fat (\%)} = 0.0565 P_8 + 2.472 \quad R^2 = 0.04 \quad \text{s.e.} = 1.61\%$$

$$\text{Chemical fat (\%)} = 0.0459 FT_{12} + 2.480 \quad R^2 = 0.05 \quad \text{s.e.} = 1.60\%$$

Visual marbling score, P_8 and FT_{12} were poorly related to chemically determined marbling fat. A marbling score of 1 was associated with a variation of about 1% to 6% chemical fat; a marbling score of 2 showed a variation of about 2.5% to 8.5%; a marbling score of 3 (six carcasses only) showed a variation of about 3.7% to 8.0% chemical fat. Lot feeders preparing cattle for the Japanese market feed cattle for up to 240 days, primarily to increase marbling fat. However, a study of 15,000 carcasses by Browne and Beasley (1991) found that visual marbling score in grass-fed carcasses was 2.3, and in grain-fed carcasses, 2.4. This suggested that attempts to increase marbling by lengthy lot-feeding were not succeeding, and that visual marbling scores were concentrated at the lower end of the marbling scale.

This study shows that chemical fat in tenth rib eye muscle is poorly related to subcutaneous fat thickness and marbling score. Visual marbling score does not appear to be sufficiently accurate to evaluate the progeny of beef sires, which Baud *et al.* (1994) found to vary considerably in their ability to marble.

BAUD, S., GODDARD, M. and HYGATE, L. (1994). Project M112, Meat Research Corporation, Sydney.
BROWNE, G.M. and BEASLEY, R.C. (1991). *Research Project No. 28*, Livestock and Meat Authority of Queensland.