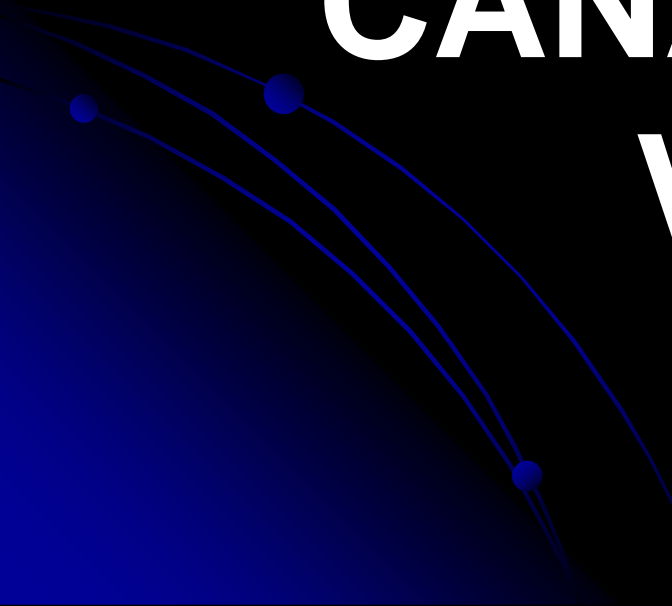




CALIDAD
de la **CARNE**
de **VACUNO**

**EVALUACIÓN
CALIDAD
CANAL Y CARNE
VACUNO**



Peso

Color

pH

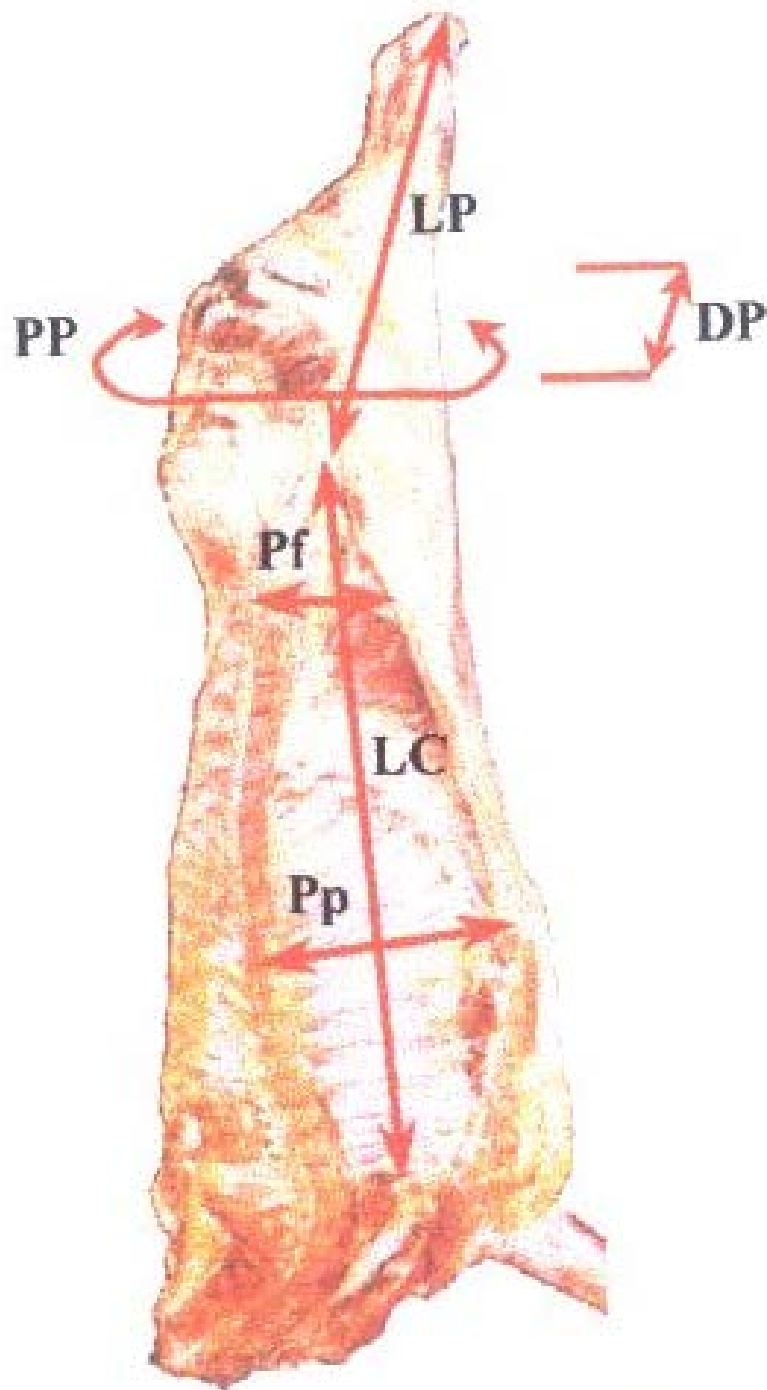
Conformación →

**Subjetivas
(con escalas)**

Sistemas automatizados

TOBEC (conduct.)

VIA (imágenes)



Costillas 6 y 10^a

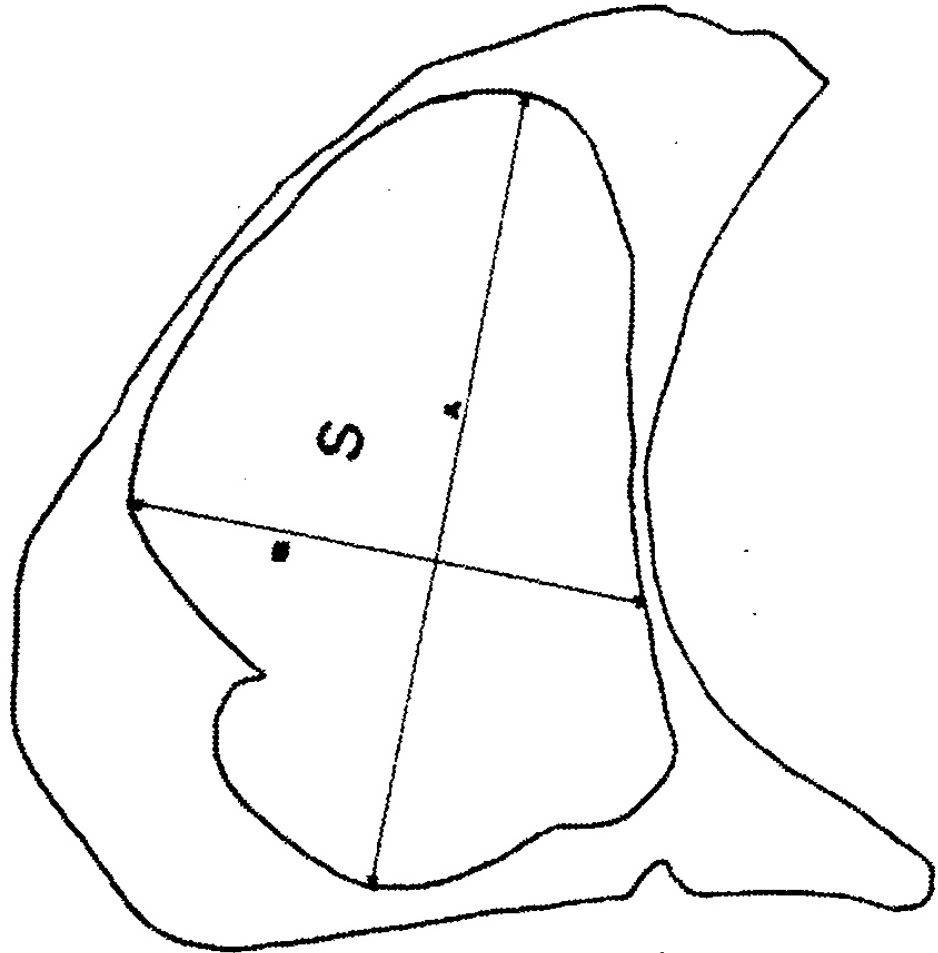
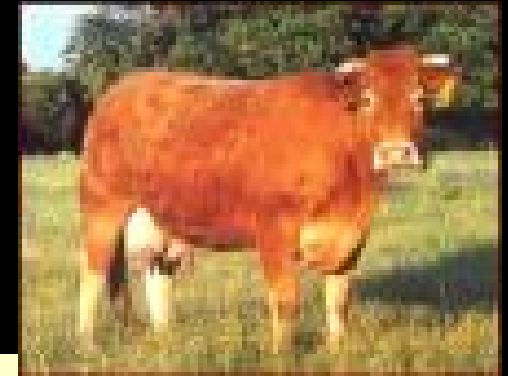
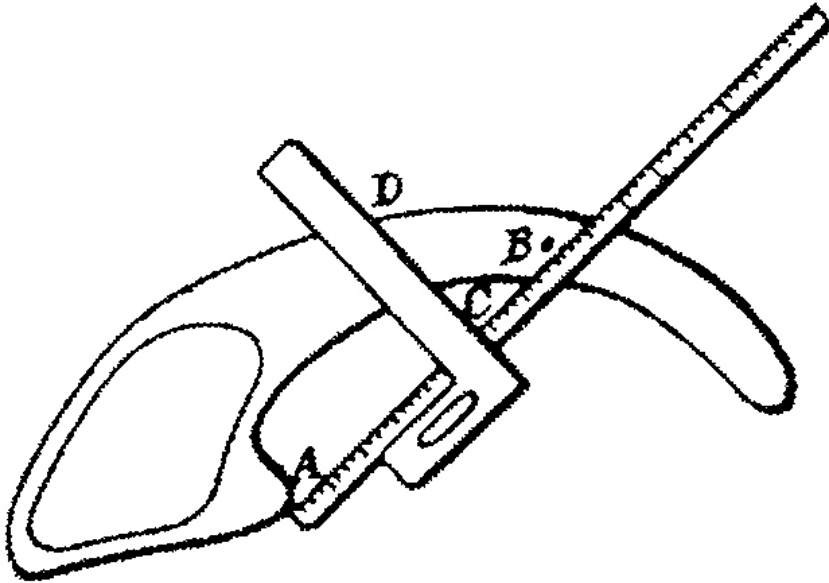


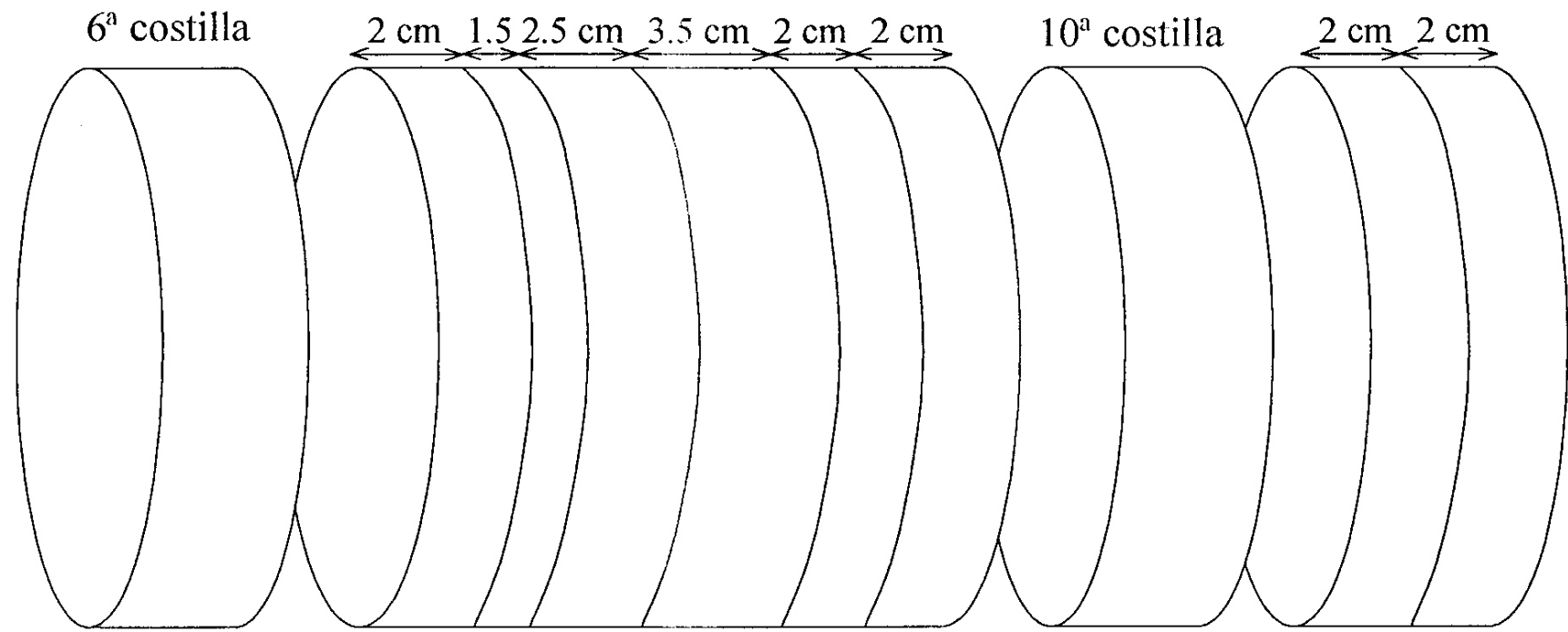
Figura N° 3.- MEDIDAS LINEALES DE LA COSTILLA
(S) Superficie del Longissimus thoracis (cm².)
(A) Diámetro mayor en sentido medio-ventral (cm.)
(B) Diámetro máximo en sentido dorso-ventral (cm.)

6ª ó 10ª costilla

- Grasa
- Hueso
- Músculo
- Deshechos



	<u>Holstein</u>	<u>Parda suiza</u>	<u>Limusín</u>
Músculo %	58	62	69
Grasa %	15	12	9
Hueso %	21	20	17



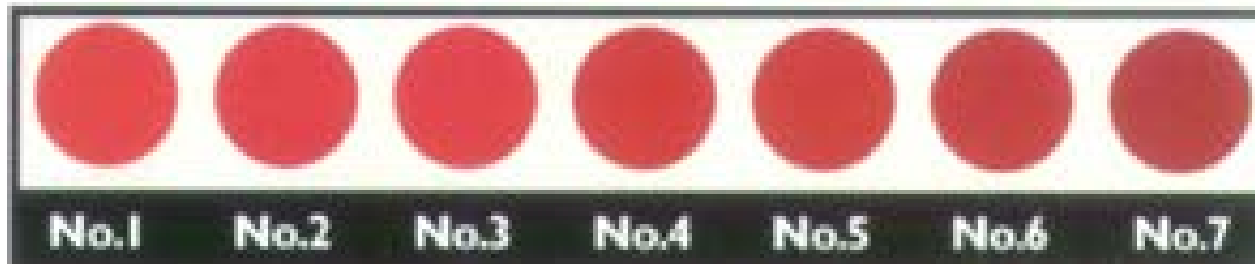
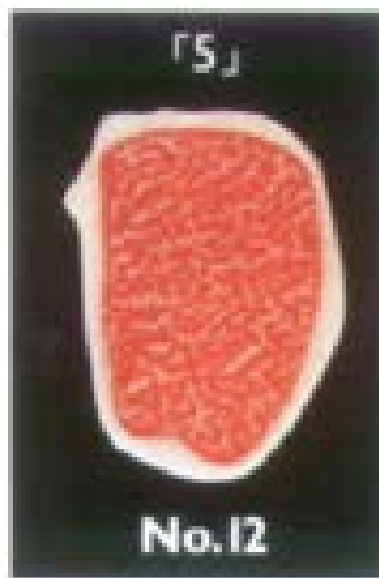
- ↓
- * pH
- * Análisis químico (AQ)
 - Humedad
 - Cenizas
 - Proteína
 - Grasa: cantidad
 calidad
 - Pigmentos hemínicos

- ↓
- * Drip loss
- ↓
- * Color
- * Colágeno
- ↓
- * Textura
- ↓
- * Fibras musculares
- * Actividad enzimática
- * El resto, para AQ

- ↓
- * Análisis sensorial

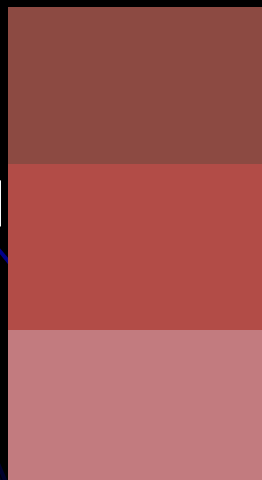
- ↓
- * Análisis sensorial
(si hace falta)





COLOR

L* luminosidad
a* rojos
b* amarillos



30-7-3

53-38-23

59-29-10





Direction of fibres

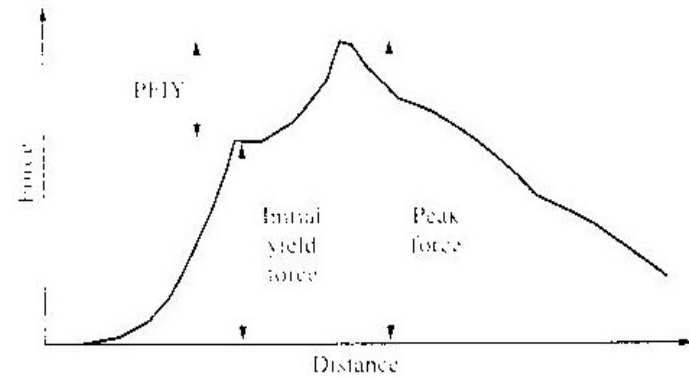


Fig. 2. Typical WB shear force deformation curve.



Dureza

Sacrificio (v. enfriamiento moderado)
Maduración (10-21 días, importante razas doble propósito)
Preparación culinaria



Table 1. Sample size (N) and averages and ranges for age at slaughter, daily gain weight, slaughter weight, carcass conformation score (EUROP), and carcass fatness score (1-15) in ten local breed-production systems of the Southwest of Europe.

Breed	N	Slaughter age (days)	Daily gain (kg/day)	Slaughter weight (kg)	Conformation score	Fatness score
AM	70	541.0 (433 – 715)	1.03 (0.50 – 1.38)	444 (399 – 566)	7.5 (R–) (2 – 11)	6.7 (3–) (4 – 11)
AV	70	415.7 (327 – 519)	1.41 (0.9 – 2.17)	509 (463 – 622)	11.8 (U+) (7 – 15)	4.1 (2–) (1 – 9)
A-NI	70	383.6 (296 – 432)	1.64 (1.10 – 2.11)	481 (435 – 531)	8.5 (R) (5 – 11)	8.0 (3) (5 – 11)
BP	67	380.6 (334 – 453)	1.63 (1.04 – 2.14)	542 (440 – 602)	11.2 (U) (10 – 14)	6.7 (3–) (4 – 11)
Mo	70	438.9 (343 – 508)	1.11 (0.57 – 1.66)	458 (340 – 545)	6.0 (O+) (4 – 9)	8.1 (3) (7 – 10)
Pi	55	382.8 (289 – 463)	1.65 (1.13 – 2.41)	552 (413 – 731)	9.9 (U–) (6 – 14)	5.5 (2) (2 – 9)
Re	68	417.7 (345 – 503)	1.41 (0.65 – 2.33)	498 (420 – 560)	9.4 (R+) (7 – 12)	8.8 (3+) (6 – 12)
Au	78	722.8 (675 – 787)	1.25 (0.83 – 1.70)	753 (686 – 830)	9.5 (U–) (5 – 13)	7.7 (3) (4 – 12)
Ga	82	492.3 (392 – 577)	1.37 (1.02 – 1.81)	610 (539 – 670)	9.5 (U–) (5 – 13)	8.0 (3) (6 – 11)
Sal	82	582.1 (488 – 720)	1.29 (0.91 – 1.86)	714 (615 – 795)	8.3 (R) (6 – 11)	8.7 (3+) (5 – 14)

AV: Asturiana de los Valles, AM: Asturiana de la Montaña, Pi: Pirenaica, BP: Bruna dels Pirineus, A-NI: Avileña-Negra Ibérica, Mo: Morucha, Re: Retinta, Au: Aubrac, Ga: Gasconne, Sal: Salers.

Table 2. Colour determinations and water holding capacity in ten local beef cattle breed - systems of South-western Europe: means and (within y standard deviations).

	AM	AV	A-NI	BP	Mo	Pi	Re	Au	Ga	Sal
N	70	70	70	70	70	55	68	78	82	82
PH7d	5.59 (0.07)	5.53 (0.07)	5.54 (0.05)	5.54 (0.09)	5.53 (0.09)	5.51 (0.05)	5.53 (0.09)	5.59 (0.08)	5.62 (0.04)	5.61 (0.07)
L*	32.24 (3.00)	38.81 (3.61)	37.73 (2.73)	38.03 (2.70)	32.60 (2.52)	38.87 (3.08)	35.45 (2.44)	38.90 (1.71)	39.64 (1.79)	38.16 (1.72)
a*	23.42 (2.91)	20.93 (2.85)	20.58 (1.87)	21.29 (2.38)	23.95 (2.69)	21.14 (2.88)	22.92 (1.85)	14.12 (1.22)	14.58 (1.31)	14.14 (1.67)
b*	13.20 (3.25)	11.67 (2.17)	10.74 (2.42)	11.20 (3.13)	12.54 (3.70)	12.28 (2.64)	11.08 (1.85)	10.02 (0.93)	10.54 (1.24)	9.32 (1.42)
Thawing losses (%)	6.81 (2.37)	6.84 (1.68)	6.83 (1.76)	6.25 (2.64)	7.69 (1.42)	8.09 (1.96)	7.41 (1.39)	7.92 (1.38)	6.17 (0.81)	7.62 (0.97)
Cooking losses (%)	14.72 (4.53)	14.42 (3.27)	23.40 (5.63)	22.91 (5.18)	24.61 (5.80)	15.29 (3.92)	13.50 (3.50)	8.69 (1.20)	9.31 (1.39)	7.40 (0.76)
WHC (%)	20.88 (2.22)	22.69 (2.21)	20.16 (1.90)	21.04 (2.53)	19.13 (1.91)	23.10 (2.18)	19.68 (5.71)	16.88 (1.51)	16.09 (1.71)	15.12 (1.94)

Table 3. Chemical composition of meat in ten local beef cattle breed - systems of South-western Europe: means and (within year standard deviations).

	AM	AV	A-NI	BP	Mo	Pi	Re	Au	Ga	Sal
Dry matter (%)	24.39 (0.82)	24.25 (0.72)	24.99 (3.19)	25.40 (0.85)	25.32 (0.91)	24.13 (1.13)	24.81 (2.48)	24.79 (0.81)	25.16 (0.58)	25.44 (0.97)
Protein content (%)	22.33 (0.48)	22.84 (0.44)	21.76 (0.99)	21.70 (0.83)	21.93 (0.94)	22.25 (0.84)	22.48 (0.66)	22.36 (0.58)	22.6 (0.60)	21.79 (0.70)
Intramuscular fat (%)	1.91 (1.01)	0.99 (0.62)	2.72 (0.72)	2.43 (0.81)	2.62 (0.60)	1.94 (0.91)	3.48 (1.78)	1.09 (0.50)	1.81 (0.73)	2.42 (1.14)
Total collagen (mg/g)	2.68 (0.57)	3.06 (0.65)	3.41 (0.55)	3.14 (0.52)	3.02 (0.68)	2.90 (0.54)	3.07 (0.59)	2.71 (0.35)	2.49 (0.31)	3.12 (0.39)
Insoluble collagen (mg/g)	1.54 (0.40)	1.69 (0.39)	2.29 (0.44)	1.86 (0.32)	1.91 (0.42)	1.68 (0.32)	1.82 (0.43)	2.39 (0.26)	2.15 (0.27)	2.80 (0.39)
Solubility of collagen (%)	42.43 (9.45)	43.10 (9.42)	32.94 (8.03)	39.97 (8.16)	35.44 (9.26)	42.08 (7.21)	40.43 (10.87)	11.60 (8.56)	13.32 (7.38)	10.64 (8.72)

Table 4. Muscle fibre characteristics in ten local beef cattle breed - systems of South-western Europe: means and (within year standard deviation)

	AM	AV	A-NI	BP	Mo	Pi	Re	Au	Ga	Sal
Haematin ($\mu\text{g/g}$)	186.21 (27.72)	136.73 (31.49)	135.94 (23.74)	147.81 (20.72)	180.83 (31.74)	143.99 (30.74)	165.80 (27.78)	181.99 (23.09)	164.09 (27.68)	176.78 (23.93)
LDH ($\mu\text{mol piruvate}$)	1084.38 (138.96)	1204.18 (184.37)	1153.18 (175.40)	1171.29 (143.59)	1168.71 (135.84)	1032.96 (121.27)	1042.89 (154.73)	1489.34 (271.29)	1549.58 (309.49)	1348.56 (245.18)
ICDH ($\mu\text{mol isocitrate}$)	1.78 (0.61)	1.48 (0.48)	1.77 (0.69)	1.64 (0.39)	1.90 (0.68)	1.35 (0.45)	2.07 (0.58)	1.58 (0.56)	1.65 (0.56)	1.80 (0.64)
Myosin (%)	35.45 (9.18)	32.10 (10.60)	26.70 (12.86)	27.87 (8.74)	39.24 (8.59)	41.49 (16.07)	31.01 (14.35)	22.91 (7.78)	29.63 (9.30)	27.33 (9.78)

Table 5. Texture measurements in ten local beef cattle breed - systems of South-western Europe: means and (within year standard deviation)

	AM	AV	A-NI	BP	Mo	Pi	Re	Au	Ga	Sal
Toughness (kg/cm ²)	1.42 (0.31)	1.76 (0.58)	1.44 (0.81)	1.47 (0.35)	1.77 (0.57)	1.67 (0.51)	1.52 (0.35)	1.63 (0.27)	1.62 (0.23)	1.95 (0.37)