FORO - AMEXITEC 2022

# “Evaluación de canales ovinas en el sureste de México: hacia donde vamos

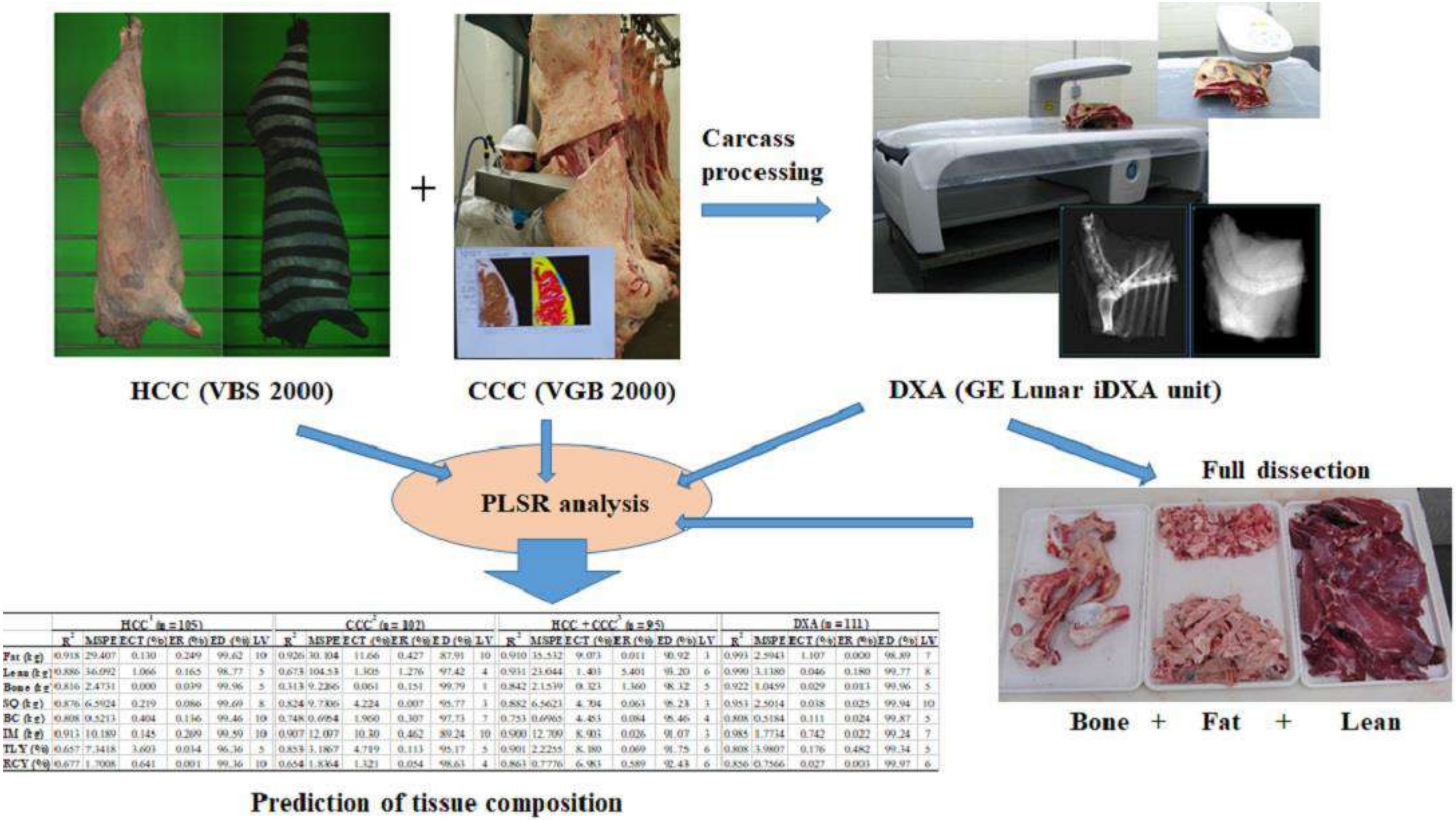
AMEXITEC
OHIO SOYBEAN COUNCIL
Consejo Mexicano de la Carne
USA Poultry & Eggs
MÉXICO UNIDO PROTEÍNA ANIMAL





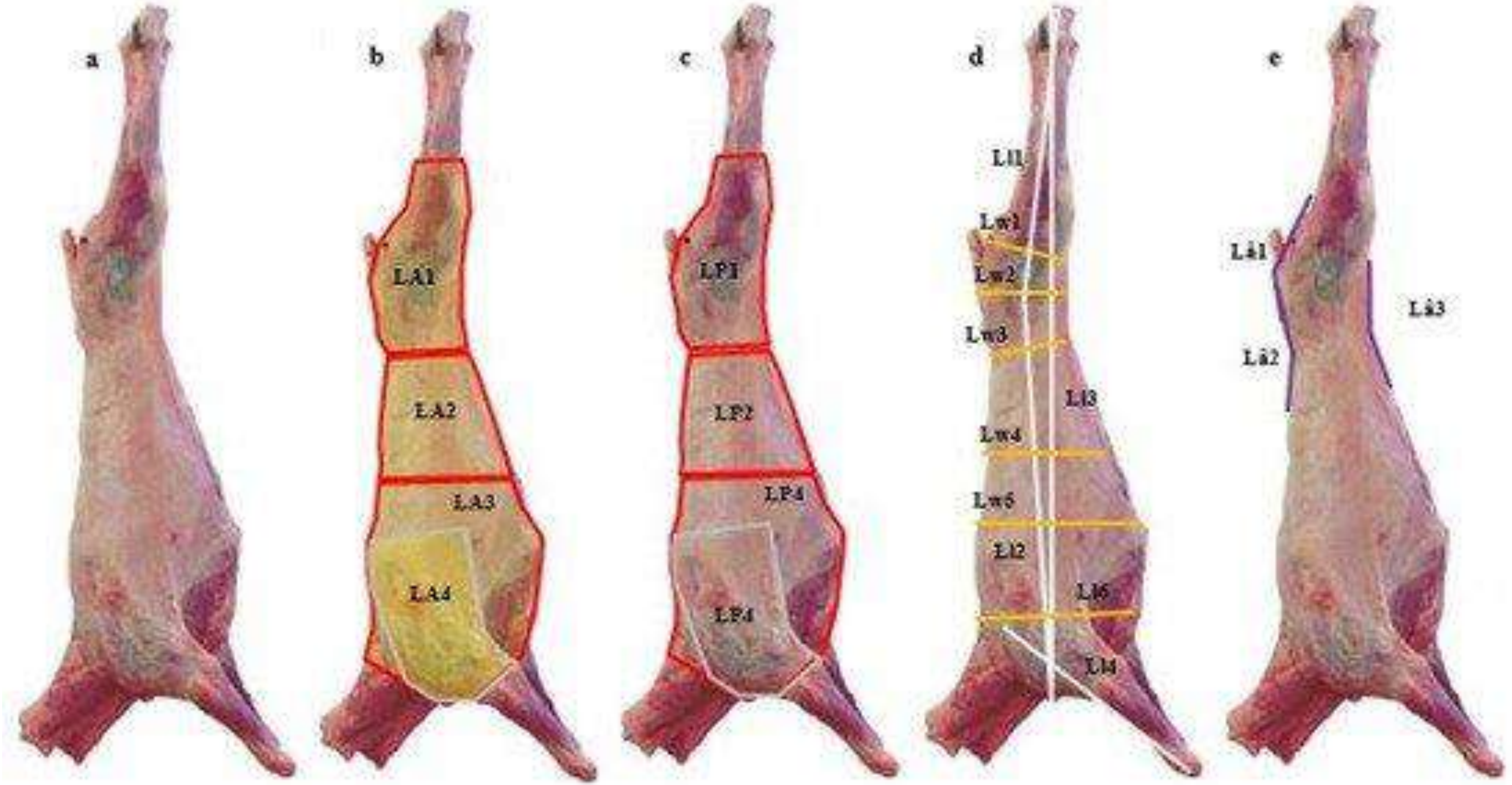

BIOPOWDER M


# En Otros Países....




| | HCC[1] (n = 105) | | | | | | CCC[2] (n = 102) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $R^2$ | MSPE | ECT (%) | ER (%) | ED (%) | LV | $R^2$ | MSPE | ECT (%) | ER (%) | ED (%) | LV |
| Fat (kg) | 0.918 | 29.407 | 0.130 | 0.249 | 99.62 | 10 | 0.926 | 30.104 | 11.66 | 0.427 | 87.91 | 10 |
| Lean (kg) | 0.886 | 36.092 | 1.066 | 0.165 | 98.77 | 5 | 0.673 | 104.53 | 1.305 | 1.276 | 97.42 | 4 |
| Bone (kg) | 0.816 | 2.4731 | 0.000 | 0.039 | 99.96 | 5 | 0.313 | 9.2266 | 0.061 | 0.151 | 99.79 | 1 |
| SQ (kg) | 0.876 | 6.5924 | 0.219 | 0.086 | 99.69 | 8 | 0.824 | 9.7306 | 4.224 | 0.007 | 95.77 | 3 |
| BC (kg) | 0.808 | 0.5213 | 0.404 | 0.136 | 99.46 | 10 | 0.748 | 0.6954 | 1.960 | 0.307 | 97.73 | 7 |
| IM (kg) | 0.913 | 10.189 | 0.145 | 0.269 | 99.59 | 10 | 0.907 | 12.097 | 10.30 | 0.462 | 89.24 | 10 |
| TLY (%) | 0.657 | 7.3418 | 3.603 | 0.034 | 96.36 | 5 | 0.853 | 3.1867 | 4.719 | 0.113 | 95.17 | 5 |
| RCY (%) | 0.677 | 1.7008 | 0.641 | 0.001 | 99.36 | 10 | 0.654 | 1.8364 | 1.321 | 0.054 | 98.63 | 4 |

| | HCC + CCC[3] (n = 95) | | | | | | DXA (n = 111) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $R^2$ | MSPE | ECT (%) | ER (%) | ED (%) | LV | $R^2$ | MSPE | ECT (%) | ER (%) | ED (%) | LV |
| Fat (kg) | 0.910 | 35.532 | 9.073 | 0.011 | 90.92 | 3 | 0.993 | 2.5943 | 1.107 | 0.000 | 98.89 | 7 |
| Lean (kg) | 0.931 | 23.644 | 1.403 | 5.401 | 93.20 | 6 | 0.990 | 3.1380 | 0.046 | 0.180 | 99.77 | 8 |
| Bone (kg) | 0.842 | 2.1539 | 0.323 | 1.360 | 98.32 | 5 | 0.922 | 1.0459 | 0.029 | 0.013 | 99.96 | 5 |
| SQ (kg) | 0.882 | 6.5623 | 4.704 | 0.063 | 95.23 | 3 | 0.951 | 2.5014 | 0.038 | 0.025 | 99.94 | 10 |
| BC (kg) | 0.753 | 0.6965 | 4.453 | 0.084 | 95.46 | 4 | 0.808 | 0.5184 | 0.111 | 0.024 | 99.87 | 5 |
| IM (kg) | 0.900 | 12.709 | 8.903 | 0.026 | 91.07 | 3 | 0.985 | 1.7734 | 0.742 | 0.022 | 99.24 | 7 |
| TLY (%) | 0.901 | 2.2255 | 8.180 | 0.069 | 91.75 | 6 | 0.808 | 3.9807 | 0.176 | 0.482 | 99.34 | 5 |
| RCY (%) | 0.863 | 0.7776 | 6.983 | 0.589 | 92.43 | 6 | 0.856 | 0.7566 | 0.027 | 0.003 | 99.97 | 6 |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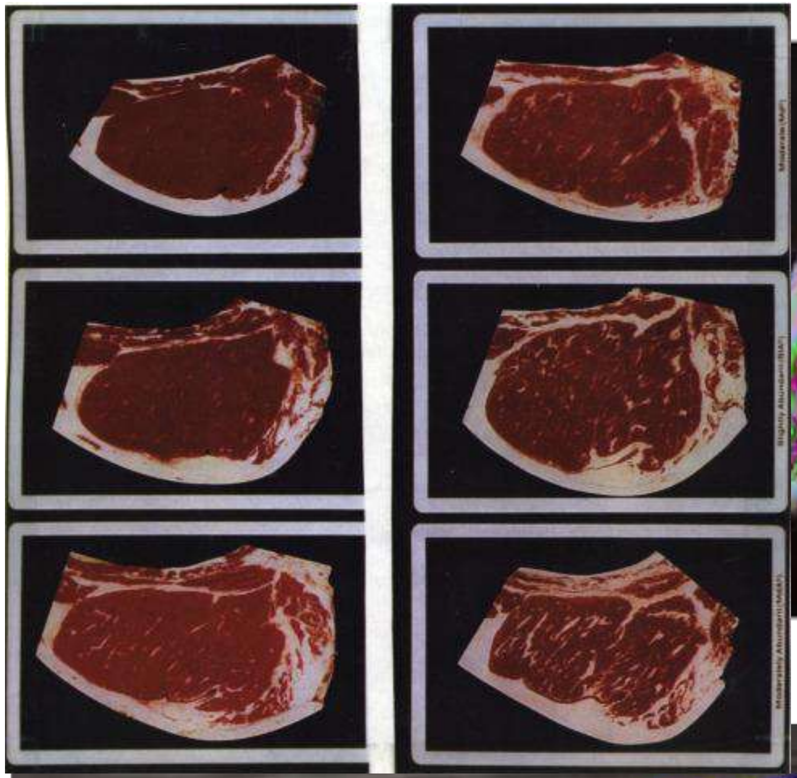

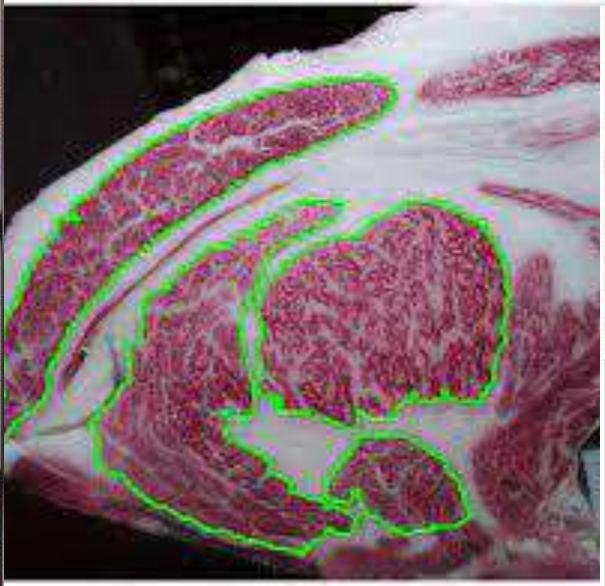

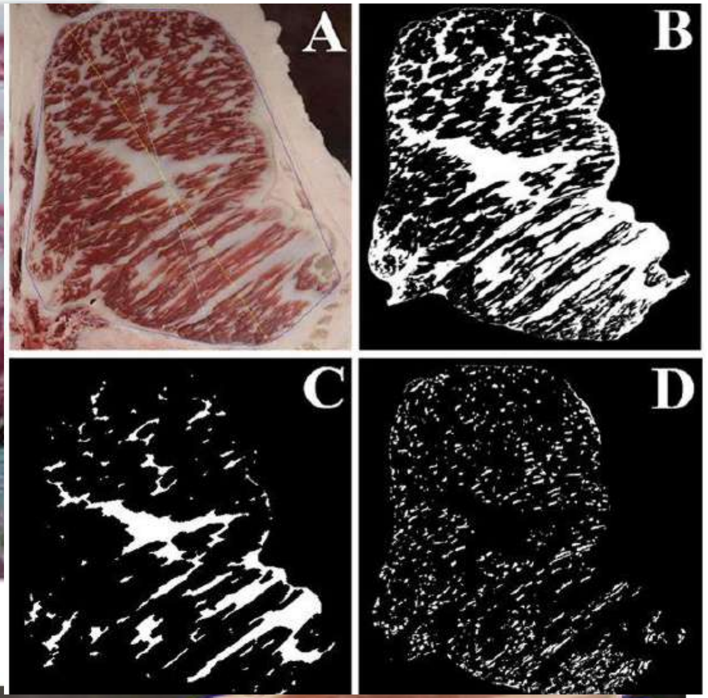
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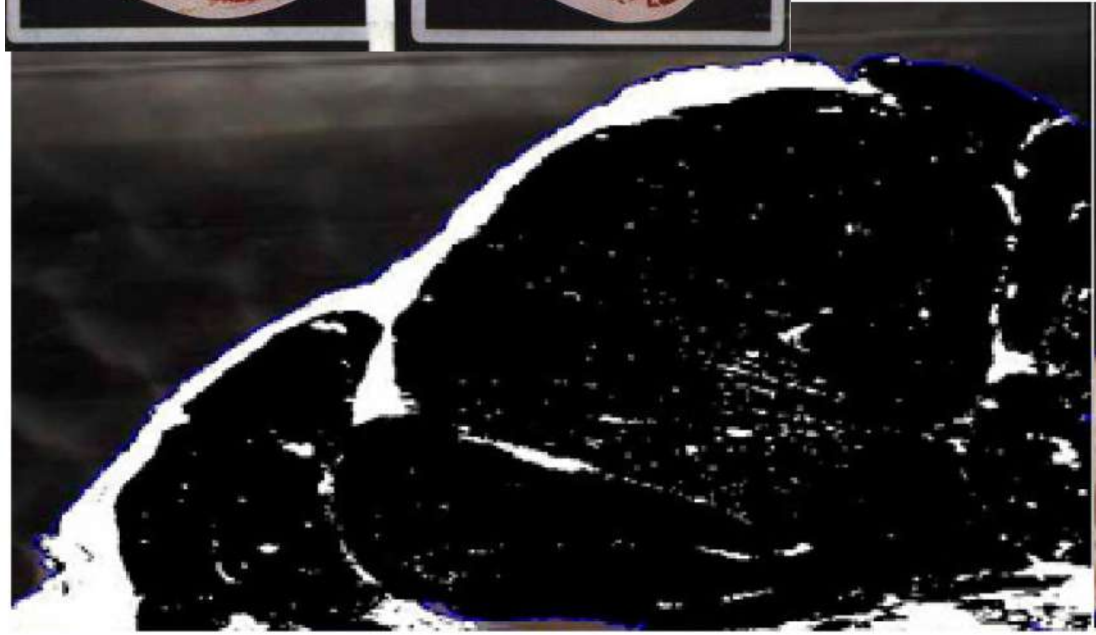

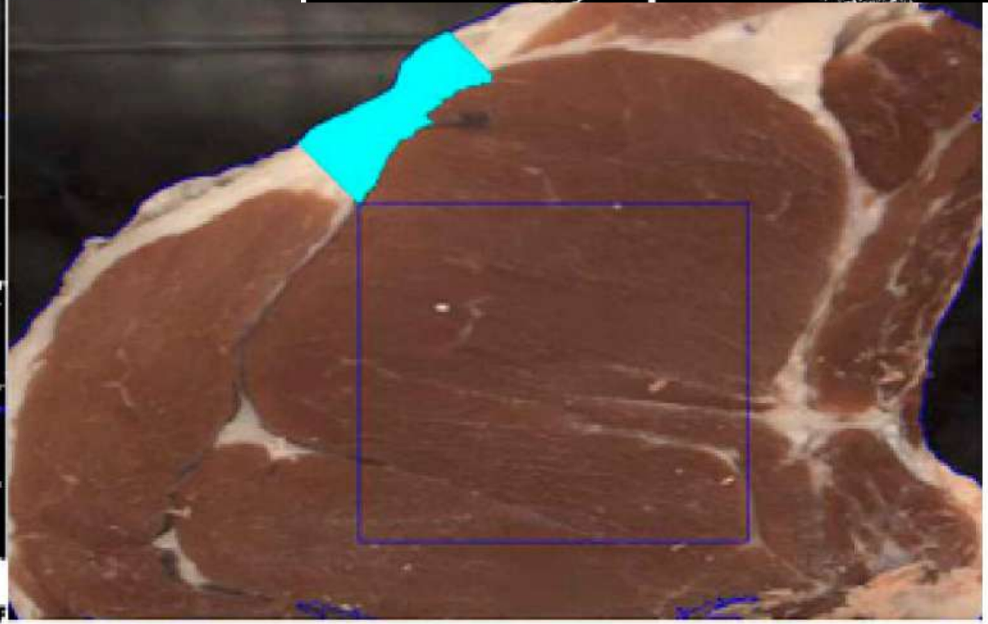


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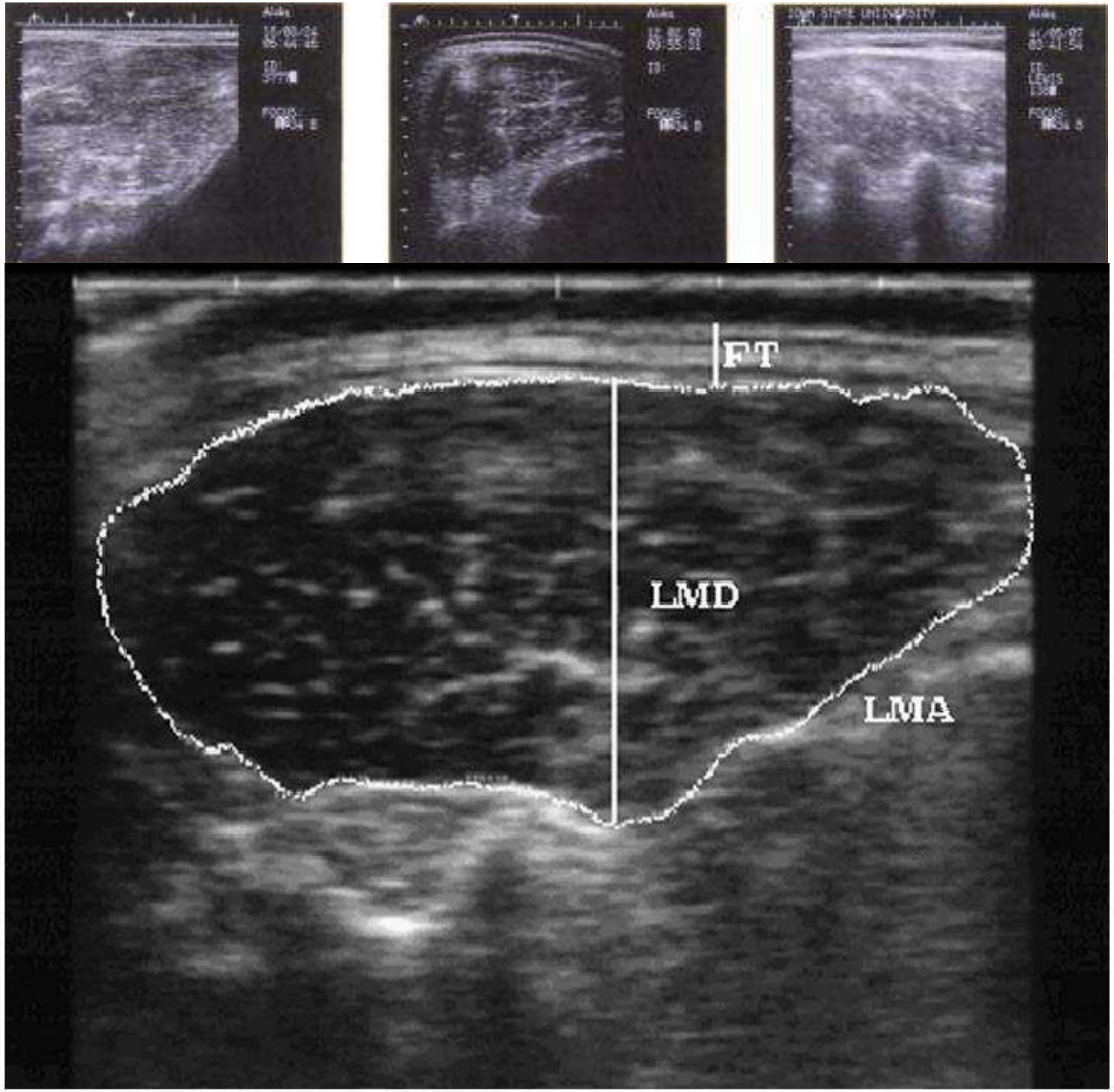
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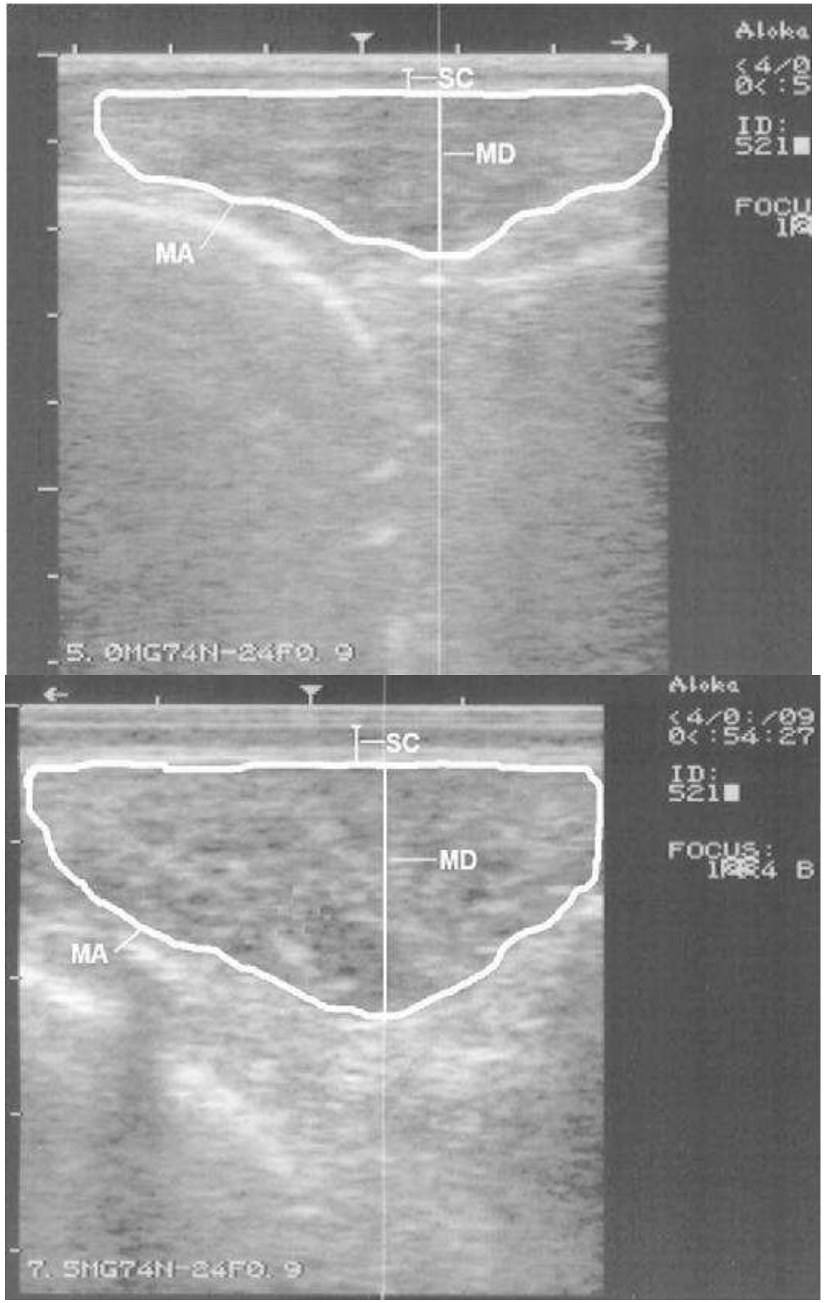
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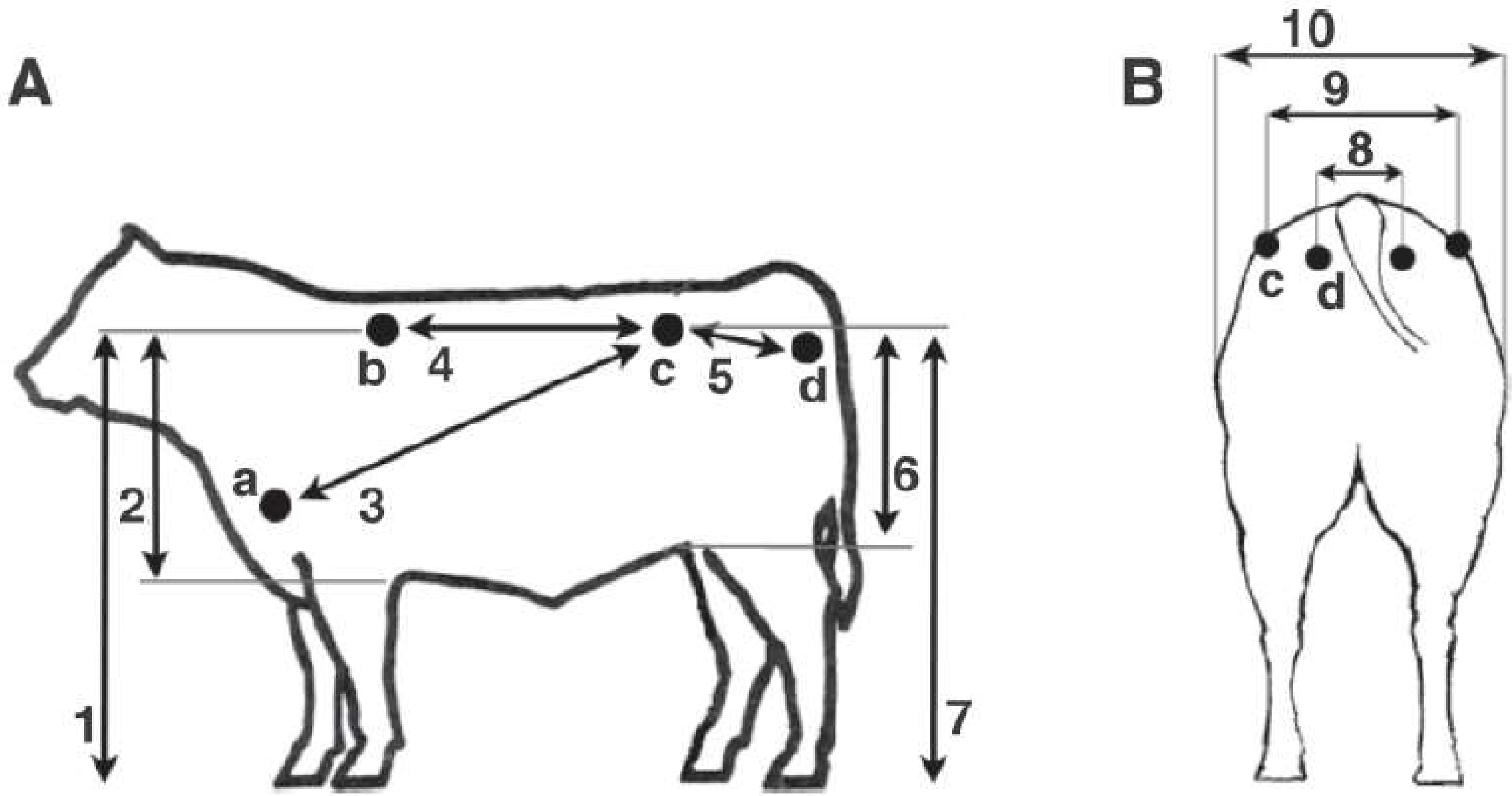
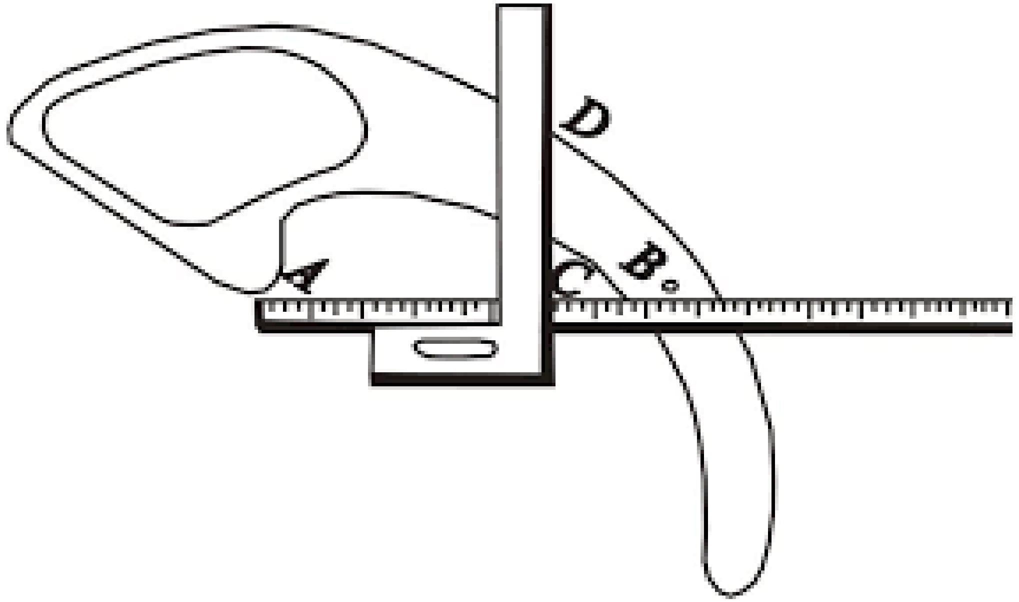
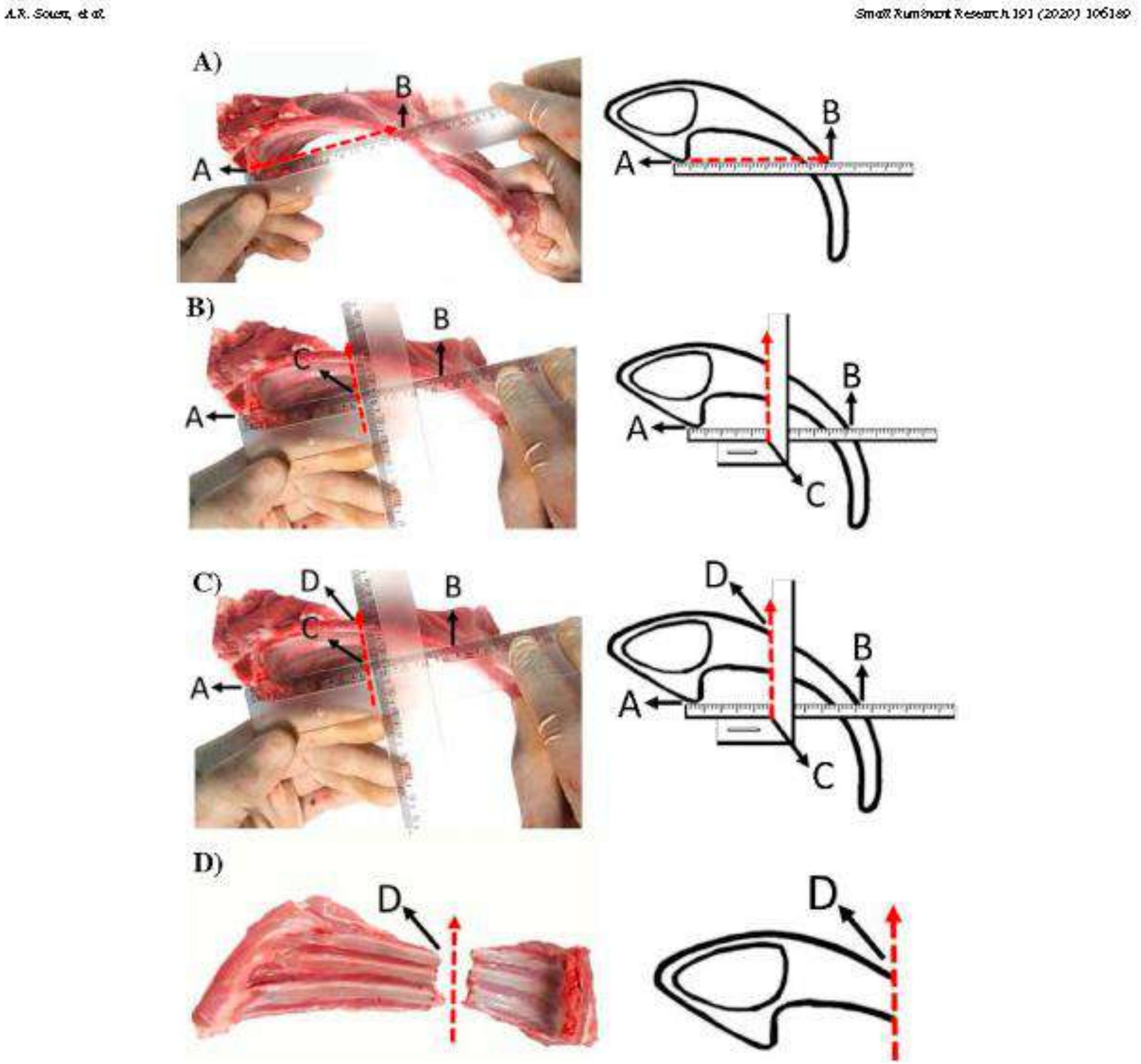



**Figure 1.** Schematic representation of A) lateral and B) posterior views of a steer showing the relative locations of biometric measurements, including 1) height at withers, 2) rib depth, 3) body diagonal length, 4) body length, 5) pelvic girdle length, 6) rump depth, 7) rump height, 8) pin bone width, 9) hook bone width, and 10) abdomen width. The girth circumference (not shown in panel A) was taken as the smallest circumference just posterior to the anterior legs in the vertical plane. Points a, b, c, and d are relative locations of the point of shoulder, withers, hook bones, and pin bones, respectively.




The $9^{th}$-$11^{th}$ rib section

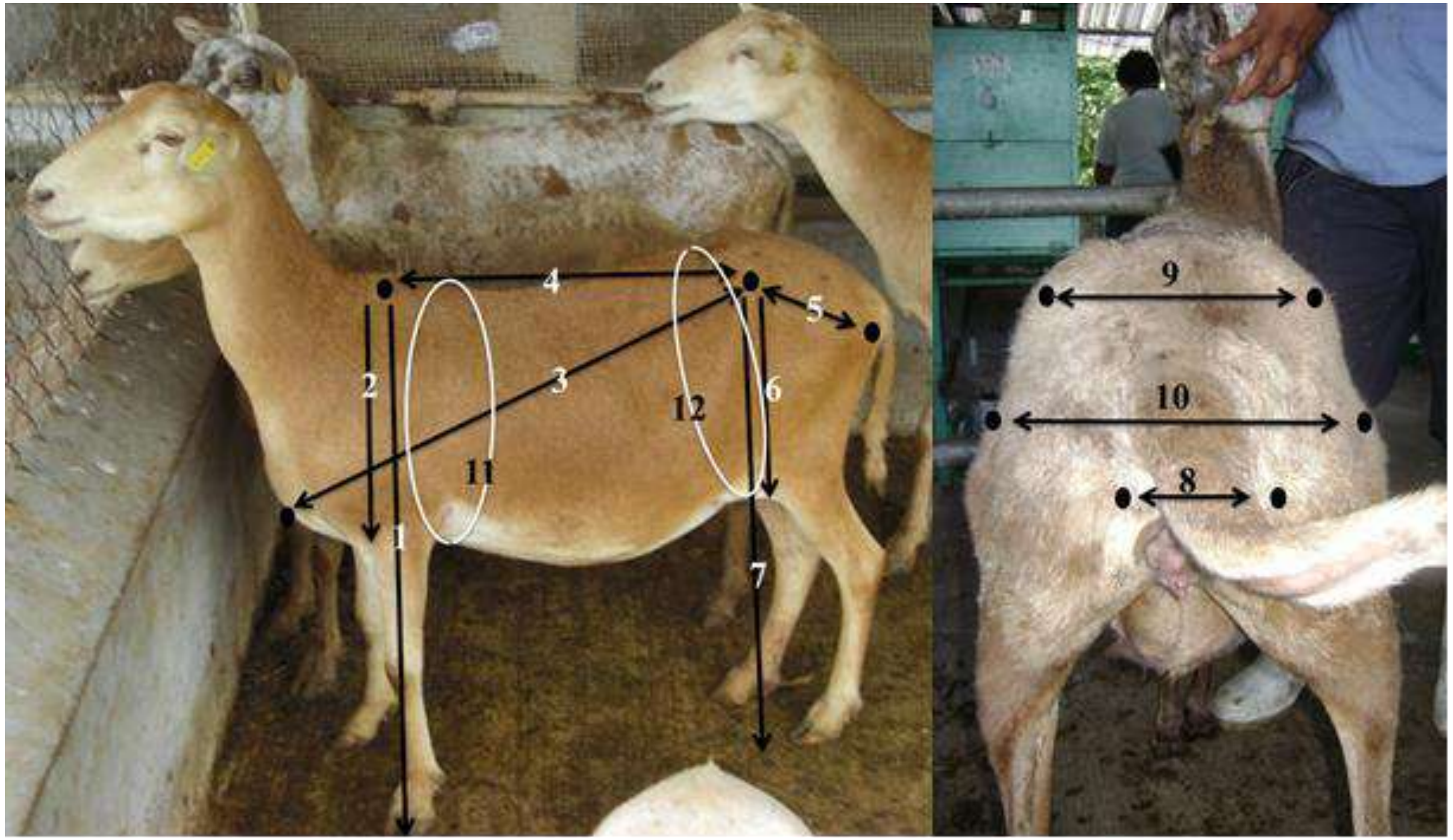



**Figura 1**. Representación esquemática de las MB registradas en borregas Pelibuey adultas: 1- Altura de la cruz (AC), 2- Profundidad de la costilla, 3-Largo del cuerpo en diagonal, 4- Largo del cuerpo, 5- Longitud ilio-isquiática, 6.- Profundidad de la anca, 7.- Altura al anca, 8- Amplitud del isquion, 9- Amplitud del ilion, 10.- Amplitud del abdomen, 11- Perímetro torácico, 12.- Perímetro abdominal.

| No. Ecuación | Ecuación | n | CME | $r^2$ |
|---|---|---|---|---|
| **PCC** | | | | |
| **14** | PCC(kg)=-47.26(±5.75***)+0.22(±0.08**)×Pto+0.17(±0.08**)×Pab+0.23 (±0.09**)×LCDi+0.86(±0,33**)×Aab | 28 | 4.03 | 0.86 |
| **PCF** | | | | |
| **18** | PCF(kg)=-47.46(±7.41***)+0.33(±0.11**)×ACr+0.32(±0.04***)×Pab-0.64(±0.30**)×Tpe+1.68(±0 .27***)×Aca | 28 | 2.45 | 0.92 |
| **RCc** | | | | |
| **19** | RCC(kg)=+22.23(±5.08***)+1.09(±0.22***)×Aab | 28 | 5.76 | 0.49 |
| **Mus** | | | | |
| **11** | Mus(kg)=-10.48(±2.32***)+0.12(±0.04**)Pto+0.48(±0.13**)×Aab | 28 | 1.02 | 0.77 |
| **CFat** | | | | |
| **15** | CFat(kg)=-26.99(±3.92***)+0.21(±0.06***)×ACr+0.19(±0.02***)×Pab-0.69(±0.16***)×Tpe+0.85( ±0.15***)×Aca | 28 | 0.69 | 0.93 |
| **Bon** | | | | |
| **17** | Bon(kg)=-1.42(±0.78**)+0.12(±0.02***)×PGr+0.11(±0.04**)×Aca | 28 | 0.07 | 0.67 |
| **IF** | | | | |
| **19** | IF(kg)=-25.66(±4.08***)+0.20(±0.04***)×Pab+0.73(±0.27**) | 28 | 2.48 | 0.72 |
| **Org** | | | | |
| **23** | Org(kg)=-38.03(±5.97***)+0.49(±0.14***)×ACr-0.32(±0.13**)×AGr+0.25(±0.04***)×Pab+0.97(± 0.24***)×Aca | 28 | 1.88 | 0.88 |
| **Des** | | | | |
| **26** | Des(kg)=-10.93(±2.71***)+0.10(±0.03**)×LCDi+0.36(±0.12**)×Tpe+0.23(±0.06***)×Aab | 28 | 0.40 | 0.67 |

## Ecuaciones de regresión desarrolladas para la relación del IMC con la condición corporal y las reservas corporales de grasa en borregas Pelibuey

| No. Ecuación | Ecuación | n | CME | DER | $r^2$ | P |
|---|---|---|---|---|---|---|
| 1 | CC= -2.47 (±0.78***)+ 0.48(±0.07***)×IMC | 28 | 0.56 | 0.75 | 0.64 | <.0001 |
| 2 | MUS (kg) = 1.90(±1.27*)+ 0.82(±0.12***)×IMC | 28 | 1.47 | 1.21 | 0.66 | <.0001 |
| 3 | IF (kg) =-6.23(±2.07**)+ 1.03 (±0.19***)×IMC | 28 | 3.90 | 1.98 | 0.54 | <.0001 |
| 4 | CF (kg) = -7.49(±1.91***) + 1.08(±0.17***)×IMC | 28 | 3.28 | 1.81 | 0.60 | <.0001 |
| 5 | TBF (kg) = -13.73(±3.83**) + 2.12(±0.35***)× IMC | 28 | 13.25 | 3.64 | 0.59 | <.0001 |

El índice de masa corporal (IMC) y las reservas energéticas corporales presentaron buena relación. El IMC podría ser utilizado como predictor de las reservas energéticas corporales en borregas Pelibuey adultas, no gestantes y no lactantes (Chavarria-Aguilar et al., 2016).

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| Equation no. | Equation | n | MSE | RSD | $r^2$ | P value |
|---|---|---|---|---|---|---|
| **1** | TBCP (kg) = 0.44 (± 0.05***) × BMI − 0.011 (± 0.0004*) × $BMI^2$ | 28 | 0.327 | 0.572 | 0.97 | < 0.0001 |
| **2** | TBF (kg) = −12.09 (± 3.27**) + 1.94 (± 0.29***) × BMI | 28 | 9.69 | 3.11 | 0.62 | < 0.0001 |
| **3** | TBA (kg) = 0.024 (± 0.0025***) × BMI − 0.0007 (± 0.002**) × $BMI^2$ | 28 | 0.0007 | 0.027 | 0.97 | < 0.0111 |
| **4** | TBE (MJ) = −442.00 (± 136.00**) + 80.22 (± 12.39***) × BMI | 28 | 16716 | 129.3 | 0.62 | < 0.0001 |
| **5** | CCP (kg) = 0.218 (± 0.008***) × BMI | 28 | 0.26 | 0.511 | 0.96 | < 0.0001 |
| **6** | CF (kg) = −7.26 (± 1.62***) + 1.07 (± 0.14***) × BMI | 28 | 2.39 | 1.54 | 0.67 | < 0.0001 |
| **7** | CA (kg) = 0.016 (± 0.002***) × BMI − 0.0004 (± 0.0001**) × $BMI^2$ | 28 | 0.0005 | 0.02 | 0.97 | < 0.0001 |
| **8** | CE (MJ)= −264.96 (± 69.71**) + 45.38 (± 6.32***) × BMI | 28 | 4391 | 66.27 | 0.66 | < 0.0001 |
| **9** | VCP (kg) = 0.51(± 0.15**) + 0.03 (± 0.01**) × BMI | 28 | 0.022 | 0.14 | 0.23 | 0.01 |
| **10** | VF (kg) = −35.13 (± 10.79**) + 6.32 (± 1.92**) × BMI − 0.23(± 0.08**) × $BMI^2$ | 28 | 3.10 | 1.76 | 0.63 | < 0.0001 |
| **11** | VA (kg) = 0.008 (± 0.0008***) × BMI − 0.0003 (± 0.00007***) × $BMI^2$ | 28 | 0.00007 | 0.008 | 0.97 | < 0.0001 |
| **12** | VE (MJ) = −1391.04 (± 424.68**) + 253.76 (± 75.91**) × BMI − 9.54(± 3.29**) × $BMI^2$ | 28 | 3778.80 | 61.47 | 0.64 | < 0.0001 |

**Salazar-Cuytun et al (2020)**

## Ecuaciones de predicción para la composición de la canal de borregas Pelibuey adultas

| No. | Ecuación | n | $R^2$ | CME | RCME | P |
|---|---|---|---|---|---|---|
| **Músculo** | | | | | | |
| 1 | Mus (kg)= 0.73(±1.77$^{ns}$)+ 0.16(±0.06**)×PV+ 0.37(±0.17*)×LDT | 20 | 0.55 | 1.093 | 1.046 | 0.0004 |
| 4 | Mus (kg)= 0.74(±1.84$^{ns}$)+ 0.16(±0.06**)×PV + 0.02(±0.49$^{ns}$)×GL + 0.37(±0.19$^{ns}$)×LDT | 20 | 0.52 | 1.162 | 1.079 | 0.0018 |
| 10 | **Mus (kg)= 0.18(±0.03)×PV + 0.38(±0.17)×LDT** | 20 | **0.98** | 1.04 | 1.02 | <.0001 |
| **Grasa** | | | | | | |
| **5** | Gra (kg)= -1.66(±0.79*)+ 0.09(±0.03**)×PV + 0.38(±0.19*)×GT -0.11(±0.09$^{ns}$)×LDT | 20 | **0.53** | 0.223 | 0.472 | 0.0016 |
| 8 | Gra (kg)= -1.77(±0.81*)+ 0.08(±0.02**)×PV + 0.29(±0.17$^{ns}$)×GT | 20 | **0.51** | 0.230 | 0.480 | 0.0008 |
| **Hueso** | | | | | | |
| **9** | Hue (kg)= 2.44(±0.49***) + 0.06(±0.01***)×PV+ -0.23(±0.11*)×GT | 20 | **0.41** | 0.088 | 0.296 | 0.0042 |

$R^2$: coeficiente de determinación; CME: cuadradado medio del error; RCME: raíz del CME; P: valor de P; * P<0.05; **P<0.001; ***P<0.0001; $^{ns}$: no significativo

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Aguilar-Hernández et al., 2016

Table 2. Regressions equations to predict the carcass traits using ultrasound measurements in discarded Pelibuey ewes (n =28). (Chay-Canul et al 2019)

| Eq. No | Equation | $r^2$ | CME | RSD | P |
|---|---|---|---|---|---|
| | **Hot carcass weight (HCW)** | | | | |
| 1 | HCW (kg) = 13.54 (±1.34 ***)+ 7.50 (±1.42 ***)×TFT | 0.51 | 13.24 | 3.63 | <.0001 |
| 2 | HCW (kg) = 13.35 (±1.16 ***)+ 5.22 (±1.42 ***)×TFT + 2.23 (±0.70**)×LFT | 0.65 | 9.83 | 3.13 | <.0001 |
| | **Cold carcass weight (CCW)** | | | | |
| 3 | CCW (kg) = 12.94 (±1.12**)+ 7.26 (±1.38***)×TFT | 0.52 | 12.50 | 3.53 | <.0001 |
| 4 | CCW (kg) = 12.75 (±1.30***)+ 5.01 (±1.37**)× TFT + 2.21 (±0.68**)×LFT | 0.66 | 9.14 | 3.02 | <.0001 |
| | **Carcass Muscle (CM)** | | | | |
| 5 | CM (kg)= 8.53 (±0.57***)+ 2.77 (±0.60 ***)×TFT | 0.44 | 2.41 | 1.55 | 0.0001 |
| 6 | CM (kg)= 8.46 (±0.51***)+ 1.90 (±0.63 **)×TFT + 0.85 (±0.31 *)×LFT | 0.57 | 1.93 | 1.38 | <.0001 |
| | **Carcass fat (CF)** | | | | |
| 7 | CF (kg)= 4.99 (±0.36 ***)×TFT | 0.87 | 3.41 | 1.84 | <.0001 |
| 8 | CF (kg)= 3.66 (±0.49***)×TFT + 1.22 (±0.35**)×LFT | 0.91 | 2.41 | 1.55 | <.0001 |


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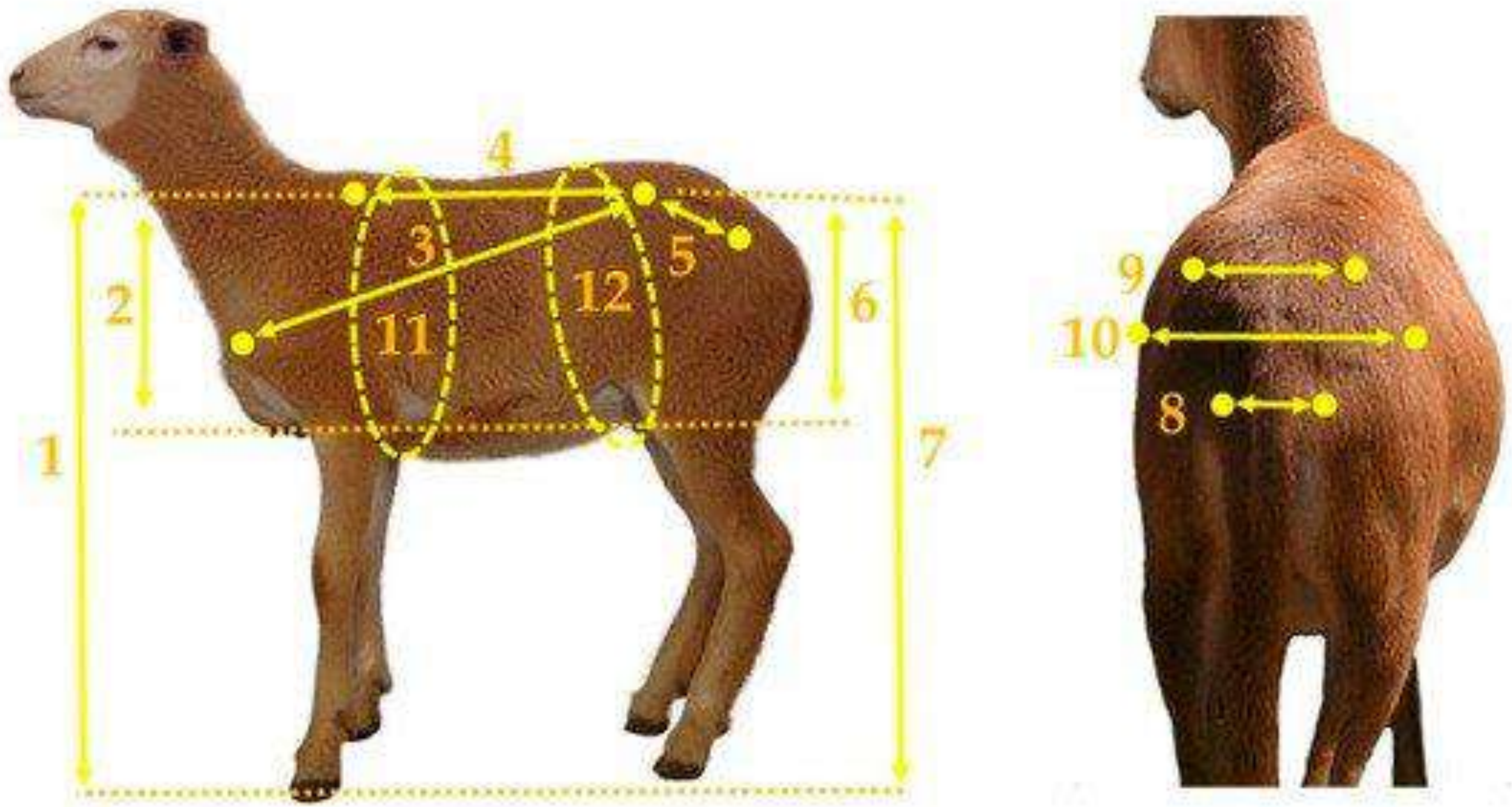


**Figure 1.** Body measurements taken in hair sheep lambs. (**1**) height at withers, (**2**) rib depth, (**3**) body diagonal length, (**4**) body length, (**5**) pelvic girdle length, (**6**) rump depth, (**7**) rump height, (**8**) pin bone width, (**9**) hook bone width, (**10**) abdomen width, (**11**) girth circumference, and (**12**) abdomen circumference. The lamb used as a reference was 56 days of age and 14.2 kg of live weight.

**Tabla 1**. Características al sacrificio y de la canal (cuadrados mínimos ± EE) en corderos lactantes Pelibuey y Katahdin (Cruz-Sánchez et al. 2021)

| **Características** | **Raza** | | **P-value** |
|---|---|---|---|
| | Pelibuey | Katahdin | |
| **PVS (kg)** | 10.73± 0.352 | 11.11± 0.420 | 0.4875 |
| **PVV (kg)** | 9.63± 0.316 | 9.91± 0.376 | 0.5706 |
| **PCC (kg)** | 5.43± 0.186 | 5.22± 0.221 | 0.4604 |
| **PCF (kg)** | 5.17± 0.179 | 4.96± 0.213 | 0.4451 |
| **RCC (%)** | 50.58± 0.516 | 46.76± 0.615 | <.0001 |
| **RCF (%)** | 48.03± 0.782 | 44.62± 0.933 | 0.0069 |
| **RV (%)** | 56.38± 0.489 | 52.38± 0.583 | <.0001 |
| | **Cortes en media canal (kg)** | | |
| **Cuello** | 0.177±0.009 | 0.220±0.010 | 0.0036 |
| **Brazo** | 0.479± 0.015 | 0.470± 0.018 | 0.7230 |
| **Costillar** | 0.646± 0.025 | 0.563± 0.030 | 0.0421 |
| **Lomo** | 0.339±0.015 | 0.317±0.018 | 0.3773 |
| **Pierna** | 0.914±0.031 | 0.905±0.037 | 0.8656 |

| No. | Equation | n | RMSE | $r^2$ | P |
|---|---|---|---|---|---|
| **TST** | | | | | |
| **10** | TST (kg) = −0.55 (±0.24***) + 0.38 (±0.02*)×SBW | 66 | 0.46 | 0.82 | <0.001 |
| **11** | TST (kg) = 1.66 (±0.58**) + 0.51 (±0.03*)×SBW − 0.07 (±0.02*)×AC | 66 | 0.41 | 0.85 | <0.001 |
| **12** | TST (kg) = 2.16 (±0.58*) + 0.54 (±0.04*)×SBW − 0.05 (±0.02**)×RuD − 0.07 (±0.02*)AC | 66 | 0.39 | 0.87 | <0.001 |
| **13** | TST (kg) = 1.52 (±0.53**) + 0.53 (±0.03 **)×SBW − 0.06 (±0.02*)×RuD − 0.07 (±0.01*)×AC + 0.10 (±0.05*)×HBW | 65 | 0.33 | 0.91 | <0.001 |
| **BON** | | | | | |
| **14** | BON (kg) = 0.47 (±0.07*) + 0.09 (±0.01**)×SBW | 66 | 0.14 | 0.74 | <0.001 |
| **15** | BON (kg) = 0.26 (±0.12*) + 0.09 (±0.01*)×SBW + 0.01 (±0.01**)×RD | 66 | 0.14 | 0.76 | <0.0001 |
| **16** | BON (kg) = 0.79 (±0.20**) + 0.12 (±0.01*)×SBW + 0.02 (±0.01*)×RD − 0.02 (±0.01*)×GC | 64 | 0.10 | 0.86 | <0.001 |
| **IF** | | | | | |
| **17** | IF (kg) = −0.24 (±0.07**) + 0.05 (±0.01*)×SBW | 66 | 0.14 | 0.47 | <0.001 |
| **18** | IF (kg) = 0.37 (±0.17**) + 0.09 (±0.01*)×SBW − 0.02 (±0.01*)×AC | 66 | 0.11 | 0.65 | <0.001 |
| **19** | IF (kg) = 0.08 (±0.01*)×SBW + 0.01 (±0.01**)×GC − 0.02 (±0.04*)×AC | 64 | 0.10 | 0.90 | <0.001 |
| **VIS** | | | | | |
| **20** | VIS (kg) = 0.11 (±0.01*)×SBW | 66 | 0.17 | 0.98 | <0.001 |
| **21** | VIS (kg) = −0.66 (±0.23 **) + 0.06 (±0.02*)×SBW + 0.03 (±0.01*)×AC | 66 | 0.17 | 0.76 | <0.001 |
| **22** | VIS (kg) = −0.89 (±0.22*) + 0.05 (±0.01**)×SBW + 0.02 (±0.01*)×RuD + 0.03 (±0.01*)×AC | 66 | 0.14 | 0.79 | <0.001 |
| **23** | VIS (kg) = −0.53 (±0.15**) + 0.07 (±0.01*)×SBW + 0.02 (±0.04*)×RuD + 0.02 (±0.04*)×AC − 0.05 (±0.02**)×HBW | 62 | 0.09 | 0.90 | <0.001 |
| **OFF** | | | | | |
| **24** | OFF (kg) = 0.41 (±0.07*) + 0.20 (±0.01*)×SBW | 64 | 0.12 | 0.94 | <0.001 |

Table 3. Regressions equations to predict the carcass composition using the neck and shoulder traits in hair suckling lambs (n=66)

| Eq. No | Equation | $R^2$ | CME | RSD | P |
|---|---|---|---|---|---|
| | **Hot carcass weight (HCW, kg)** | | | | |
| 1 | HCW (kg) = 16.04 (±0.18 ***)×SST | 0.99 | 0.24 | 0.49 | <.0001 |
| 2 | HCW (kg) = 0.12 (±0.24ns)+ 3.64 (±1.24***)×NW + 13.56 (±0.99***)×SST | 0.88 | 0.22 | 0.46 | <.0001 |
| | **Cold carcass weight (CCW, kg)** | | | | |
| 3 | CCW (kg) = 15.31 (±0.14***)×SST | 0.99 | 0.15 | 0.38 | <.0001 |
| 4 | CCW (kg) = -0.74 (±0.2**)+ 12.33 (±0.90***)×SST + 12.06 (±2.69***)×SBO | 0.94 | 0.11 | 0.33 | <.0001 |
| | **Carcass soft tissue (CST, kg)** | | | | |
| 5 | CST (kg)= -0.66 (±0.14 ***)+ 12.80 (±0.44 ***)×SST | 0.93 | 0.08 | 0.28 | <.0001 |
| 6 | CST (kg)= -0.84 (±0.15***)+ 3.05 (±0.94***)×SW + 8.95 (±1.25**)×SST | 0.94 | 0.07 | 0.26 | <.0001 |
| | **Carcass bone (CB, kg)** | | | | |
| 7 | CB (kg)= 0.19 (±0.09*)+ 8.89 (±0.59***)×SBO | 0.78 | 0.02 | 0.14 | <.0001 |
| 8 | CB (kg)= 0.22 (±0.07 ***)+ 1.37 (±0.30***)×SST+ 5.57 (±0.91***)×SBO | 0.83 | 0.01 | 0.10 | <.0001 |
| 9 | CB (kg)= 0.21 (±0.07 ***) -1.11 (±0.47*)×SWE+ 2.37 (±0.52***)×SST+ 7.01 (±1.07***)×SBO | 0.85 | 0.01 | 0.10 | <.0001 |

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# Lo más “IN”

CONGRESO ARGENTINO DE PRODUCCIÓN ANIMAL

# Predicción de la composición tisular de canales de corderos a partir de medidas de la canal y ultrasonográficas

Mendoza, A.[1]; Rubio, C.[1]; Vidal, D.[1]; Vázquez, S.[1], Escalante, S.[1], López, S.[1], Miccoli, F.[2], Chay-Canul, A.[1].

[1]Universidad Juárez Autónoma de Tabasco, Villahermosa, Tabasco, México.

**Cuadro 2: Ecuaciones de predicción de la composición tisular (músculo, grasa y hueso) por medio de medidas por ultrasonido y de la canal en corderos Blackbelly (n= 20)**

| Ecuación | | $r^2$ | CME | RCCME | Valor de P |
|---|---|---|---|---|---|
| 1 | MC (kg)= -8.40 (±3.74*)+ 73.58 (±12.84***)*ICC+0.15 (±0.06*)*LC | 0.69 | 0.52 | 0.72 | <.0001 |
| 2 | GC (kg)= -1.27 (±0.58*)+ 0.20.90(±4.66***)*ICC | 0.54 | 0.07 | 0.26 | 0.003 |
| 3 | HC (kg)= -4.77 (±0.87***)+ 18.05 (±2.99***)*ICC+0.10 (±0.01*)*LC | 0.78 | 0.02 | 0.14 | <.0001 |

Mendoza, A.R., et al 2021

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# Prediction of carcase characteristics using neck traits from hair-sheep ewes

Flor de María Rivera-Alegria[a], Francisco G. Ríos-Rincón[b], Ulises Macías-Cruz[c], Ricardo A. Garcia-Herrera[a], José Herrera-Camacho[d], Mohammed Benaouda[e], Juan C. Angeles-Hernandez[f], Alfonso L. Muñoz-Benítez[f], Einar Vargas-Bello-Pérez[g] and Alfonso J. Chay-Canul[a]

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**Table 2.** Regressions equations to predict the carcase composition using the neck and shoulder traits in Pelibuey ewes ($n = 50$).

| Eq. no. | Equation | $r^2_{adj}$ | RMSE | AIC | BIC | *p*-value |
|---|---|---|---|---|---|---|
| Carcase muscle weight (kg) | | | | | | |
| 1 | 4.79 (±0.69***) + 16.48 (±2.11***) × NMW | 0.56 | 1.95 | 179.07 | 184.81 | .0001 |
| 2 | 4.92 (±0.64***) + 14.07 (±2.13***) × NMW + 7.52 (±2.57**) × NFW | 0.63 | 1.69 | 173.17 | 180.81 | <.0001 |
| 3 | 5.60 (±0.78 ***) − 21.30 (±5.63 ***) × NBW − 9.62 (± 4.39) × NFW + 15.54 × (±2.35) × NW | 0.64 | 2.77 | 172.99 | 182.55 | <.0001 |
| Carcase fat weight (kg) | | | | | | |
| 4 | −3.37 (±0.91***) + 11.37 (±1.53 ***) × NW | 0.53 | 2.95 | 199.87 | 205.61 | <.0001 |
| 5 | −1.30 (±0.83 *) + 14.57 (±1.37 ***) × NW − 22.32 (±4.26 ***) × NBW | 0.71 | 1.90 | 177.47 | 185.12 | <.0001 |
| 6 | −1.51 (±0.81*) + 17.37 (±2.47***) × NMW + 11.65 (±2.84***) × NFW − 10.24 (±4.25***) × NBW | 0.73 | 2.86 | 176.85 | 186.41 | <.0001 |
| Carcase bone weight (kg) | | | | | | |
| 7 | 3.09 (±0.18***)+ 2.44 (±0.55***) × NMW | 0.29 | 0.80 | 45.39 | 51.13 | <.0001 |
| 8 | 3.14 (±0.20***) + 3.05 (±1.25***) × NMW − 0.41(±0.73) × NW | 0.26 | 0.79 | 47.07 | 54.72 | <.01 |
| 9 | 3.02 (±0.22*) + 3.25 (±1.25***) × NMW − 0.71 (±0.77***) × NW + 1.37 (±1.14***) × NBW | 0.27 | 0.78 | 47.53 | 57.09 | <.01 |

Adj. $r^2$: determination coefficient adjusted to parameter numbers of models; RMSE: root mean square error; AIC: Akaikés Information Criterion; BIC: Bayesian Information Criterion; NW: neck weight (kg); NMW: neck muscle weight (kg); NFW: neck fat weight (kg); NBW: neck bone weight (kg). $^*p < 0.05$; $^{**}p < 0.001$; $^{***}p < .0001$; ns: non-significant.

# Using the 9th–11th rib section to predict carcase tissue composition in Blackbelly sheep

Samuel Escalante-Clemente[a], Samuel Vázquez-Jiménez[a], Saravasti K. López-Durán[a], Darwin N. Arcos-Alvarez[b], Tomas A. Arbez-Abnal[b], Ángel T. Piñeiro-Vazquez[b], Alfonso L. Muñoz-Benítez[c], Einar Vargas-Bello-Pérez[d] and Alfonso J. Chay-Canul[a]

[a]División Académica de Ciencias Agropecuarias, Universidad Juárez Autónoma de Tabasco, Colonia Centro Tabasco, Villahermosa, México; [b]Tecnologico Nacional de Mexico/IT -Conkal, Km. 16.3 Antigua Carretera Mérida-Motul, Conkal, México; [c]Instituto de Ciencias Agropecuarias, Universidad Autónoma del Estado de Hidalgo, Av. Universidad km. 1, Tulancingo de Bravo, Hidalgo, México; [d]Department of Veterinary and Animal Sciences, Faculty of Health and Medical Sciences, University of Copenhagen, Frederiksberg C, Denmark



**Table 3.** Regression equations to predict carcase tissue composition in Blackbelly sheep using the 9th–11th rib section.

| No. | | Equation | $r^2$ | MSE | RMSE | $p$-Value |
|---|---|---|---|---|---|---|
| 1 | CM (kg) | 0.89 (±0.66*) + 1.11 (±0.10***) × LHCW+ 24.49 (±10.16*) × FRib | 0.90 | 0.12 | 0.34 | <.0001 |
| 2 | CF (kg) | −0.19 (±0.41*) + 0.16 (±0.06*) ×LHCW + 20.37 (±6.04 **) × FRib | 0.61 | 0.05 | 0.22 | .0007 |
| 3 | CB | 0.58 (±0.34*) + 0.28 (±0.05 ***) ×LHCW + 9.32 (±2.49**) × BRib | 0.80 | 0.02 | 0.14 | <.0001 |

CM: Carcase muscle (kg); CF: Carcase fat (kg); CB: carcase bone (kg); MRib: Muscle in the 9th–11th rib section (kg); FRib: fat in 9–11 rib section (kg); BRib: Bone in the 9th–11th rib section (kg); LHCW: left half-carcases weight (kg).
Values within parentheses are the SE of the parameter estimates. *$p < .05$; **$p < .01$; ***$p < .001$

**Table 3. Regression equations to predict carcass tissue composition in Katahdin sheep using the 9th-11th rib section (n=45)**

| Eq. No | Equation | $r^2$ | RMSE | AIC | BIC | p-value |
|---|---|---|---|---|---|---|
| Carcass muscle weight (kg) | | | | | | |
| 1 | 2.81 (±0.53***) + 56.64 (±4.02***) × MRib | 0.82 | 1.29 | 24.79 | 26.58 | <.0001 |
| 2 | 3.06 (±0.51***) + 69.40 (±6.51***) × MRib -24.66 (±10.21**) × BRib | 0.85 | 1.22 | 20.95 | 23.43 | <0.0001 |
| Carcass fat weight (kg) | | | | | | |
| 3 | 0.42 (±0.15**) + 38.27 (±2.99 ***) ×FRib | 0.79 | 0.56 | -47.04 | -44.95 | <0.0001 |
| Carcass bone weight (kg) | | | | | | |
| 4 | 1.43 (±0.28***)+ 18.59 (±2.14***) ×MRib | 0.64 | 0.68 | -30.56 | -28.801 | <0.0001 |

**Antonio-Molina et al., 2022, inédito**

**Table 4. Regression equations to predict carcass tissue composition using In vivo ultrasound and biometric measurements predict carcass traits in Blackbelly sheep (n=40)**

| No. | Equation | $R^2$ | MSE | RMSE | P-value |
|---|---|---|---|---|---|
| 1 | CM (kg)= 4.23(±0.90***) + 2.64 (±0.45***) × PM | 0.49 | 0.98 | 0.98 | <0.0001 |
| 2 | CM (kg) = -6.22 (±2.04**) + 0.16 (±0.030***) ×PT+1.96 (±0.36***) ×PM | 0.72 | 0.54 | 0.73 | <0.0001 |
| 3 | CM (kg) = -10.40 (±2.06**) + 0.14 (±0.03***) ×LC+0.16 (±0.02***) ×PT+1.10 (±0.38**) ×PM | 0.80 | 0.39 | 0.62 | <0.0001 |
| 4 | CM (kg) = -11.42 (±1.94**) + 0.16 (±0.03***) ×LC+0.15 (±0.02***) ×PT+2.42 (±0.60***) ×PM+0.38 (±0.14) ×ARM | 0.84 | 0.33 | 0.57 | <0.0001 |
| 5 | CF (kg) = -1.60 (±0.92**) + 0.03(±0.01*) ×PA | 0.21 | 0.13 | 0.36 | < 0.0036 |
| 6 | CF (kg) = -1.89 (±0.88) + 0.03(±0.01**) ×PA+0.36 (±0.16ns) ×PM | 0.31 | 0.11 | 0.33 | <0.0015 |
| 7 | CB (kg) = 1.75 (±0.29***) + 0.70(±0.15***) ×PM | 0.37 | 0.11 | 0.33 | <0.0001 |
| 8 | CB (kg) = -1.78 (±1.18) + 0.05 (±0.01**) × AA+ 0.69 (±0.13***) × PM | 0.51 | 0.08 | 0.28 | <0.0001 |

Samuel Vázquez-Jiménez et al 2021

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# Estimation of Carcass Tissue Composition from the Neck and Shoulder Composition in Growing Blackbelly Male Lambs

Miguel A. Gastelum-Delgado [1], José Antonio Aguilar-Quiñonez [1], Carlos Arce-Recinos [2], Ricardo A. García-Herrera [2], Ulises Macías-Cruz [3], Héctor A. Lee-Rangel [4], Alvar A. Cruz-Tamayo [5], Juan C. Ángeles-Hernández [6], Einar Vargas-Bello-Pérez [7,*] and Alfonso J. Chay-Canul [2,*]

**Table 2.** Predictive regression equations for carcass tissue composition using the neck and shoulder tissue traits as predictors in Blackbelly male lambs ($n$ = 40).

| ID | Model | Adj. $R^2$ | MSPE | AIC | BIC |
|---|---|---|---|---|---|
| 1 | = 0.29(0.69) + 5.61(0.51) × W + 3.63(0.87) × NM | 0.81 | 0.37 | 82.67 | 89.42 |
| 2 | = −0.36(0.76) + 5.62(0.83) × SM + 10.49(3.62) × SB + 3.26(0.83) × NM | 0.83 | 0.33 | 79.27 | 87.72 |
| 3 | = −0.40(0.76) + 5.33(0.91) × SM + 2.16(2.67) × SF + 10.68(3.65) × SB + 3.36(0.85) × NM | 0.82 | 0.32 | 80.53 | 90.66 |
| | Carcass fat (CF) | | | | |
| 4 | = −0.05(0.24) + 0.75(0.29) × SM + 3.31(1.15) × SF + 4.52(0.91) × NF | 0.62 | 0.061 | 11.38 | 19.83 |
| 5 | = −0.17(0.25) + 0.62(0.30) × SM + 3.68(1.16) × SF + 0.51(0.37) × NM + 4.15(0.93) × NF | 0.62 | 0.057 | 11.20 | 21.33 |
| 6 | = −0.06(0.27) + 3.09(0.31) × SM + 3.09(1.29) × SF + 0.55(0.37) × NW + 4.17(1.22) × NF − 1.41(0.94) × NB | 0.63 | 0.055 | 11.95 | 23.77 |
| | Carcass bone (CB) | | | | |
| 7 | = 0.91(0.32) + 5.98(1.22) × SB + 0.78(0.25) × NW | 0.55 | 0.063 | 11.04 | 17.81 |
| 8 | = 0.84(0.32) + 5.82(1.19) × SB + 1.08(0.31) × NW − 1.74(1.09) × NF | 0.57 | 0.059 | 10.34 | 18.79 |
| 9 | = 0.87(0.32) + 5.67(1.21) × SB + 1.66(0.77) × NW − 0.73(0.90) × NM − 2.56(1.50) × NF | 0.56 | 0.057 | 11.61 | 21.73 |

Shoulder weight (SW), shoulder muscle (SM), shoulder fat (SF), shoulder bone (SB), neck weight (NW), neck muscle (NM), neck fat (NF), neck bone (NB), carcass muscle (CM), carcass fat (CF), carcass bone (CB), adjusted determination coefficient ($r^2$adj), mean square error (MSPE), Akaike's Information Criterion (AIC) and Schwartz's information criterion (BIC).

# Perspectivas….


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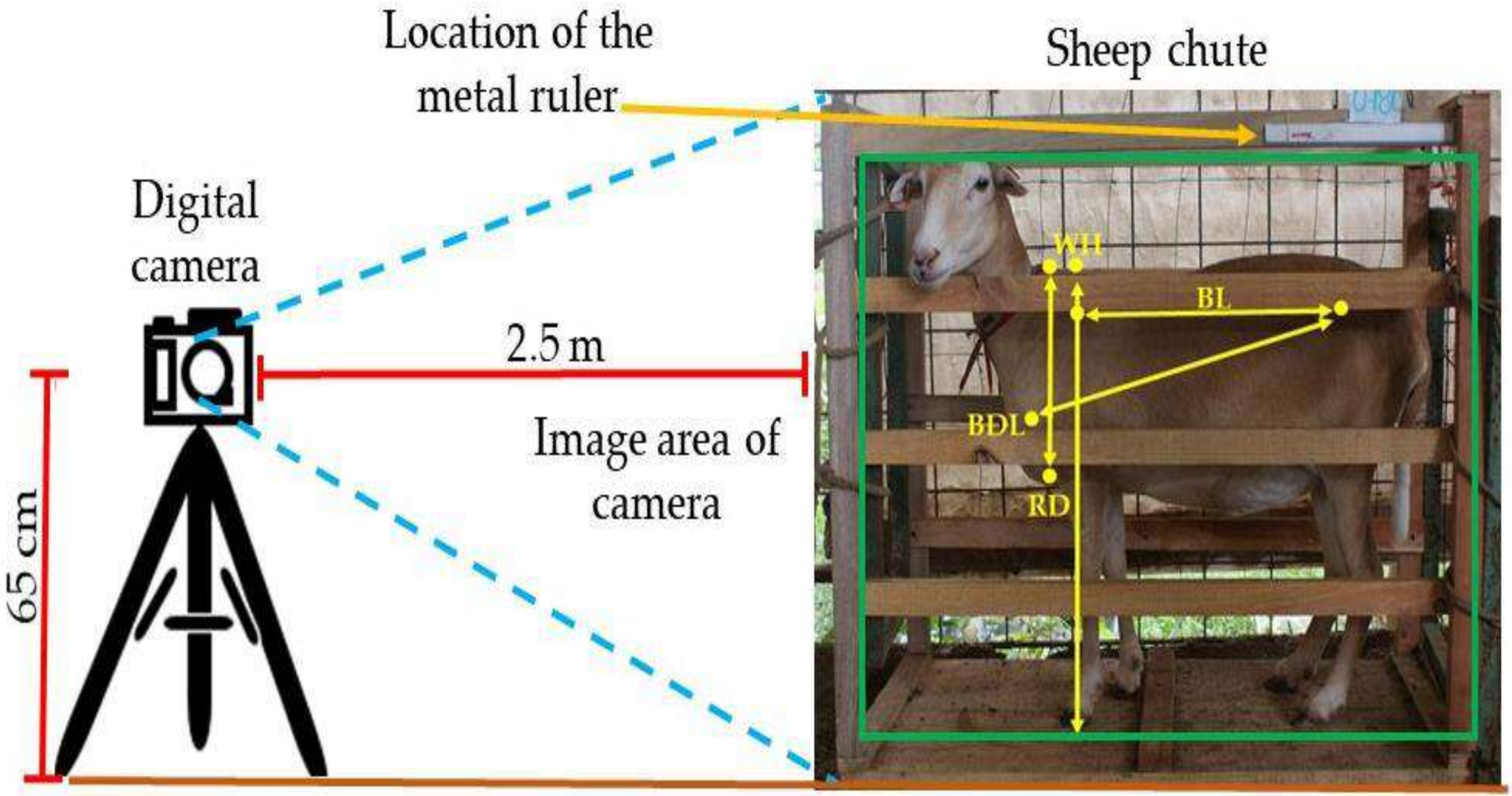
" Estudio en la duda. Acción en la fe "



Location of the metal ruler
Sheep chute
Digital camera
2.5 m
65 cm
Image area of camera
WH
BL
BDL
RD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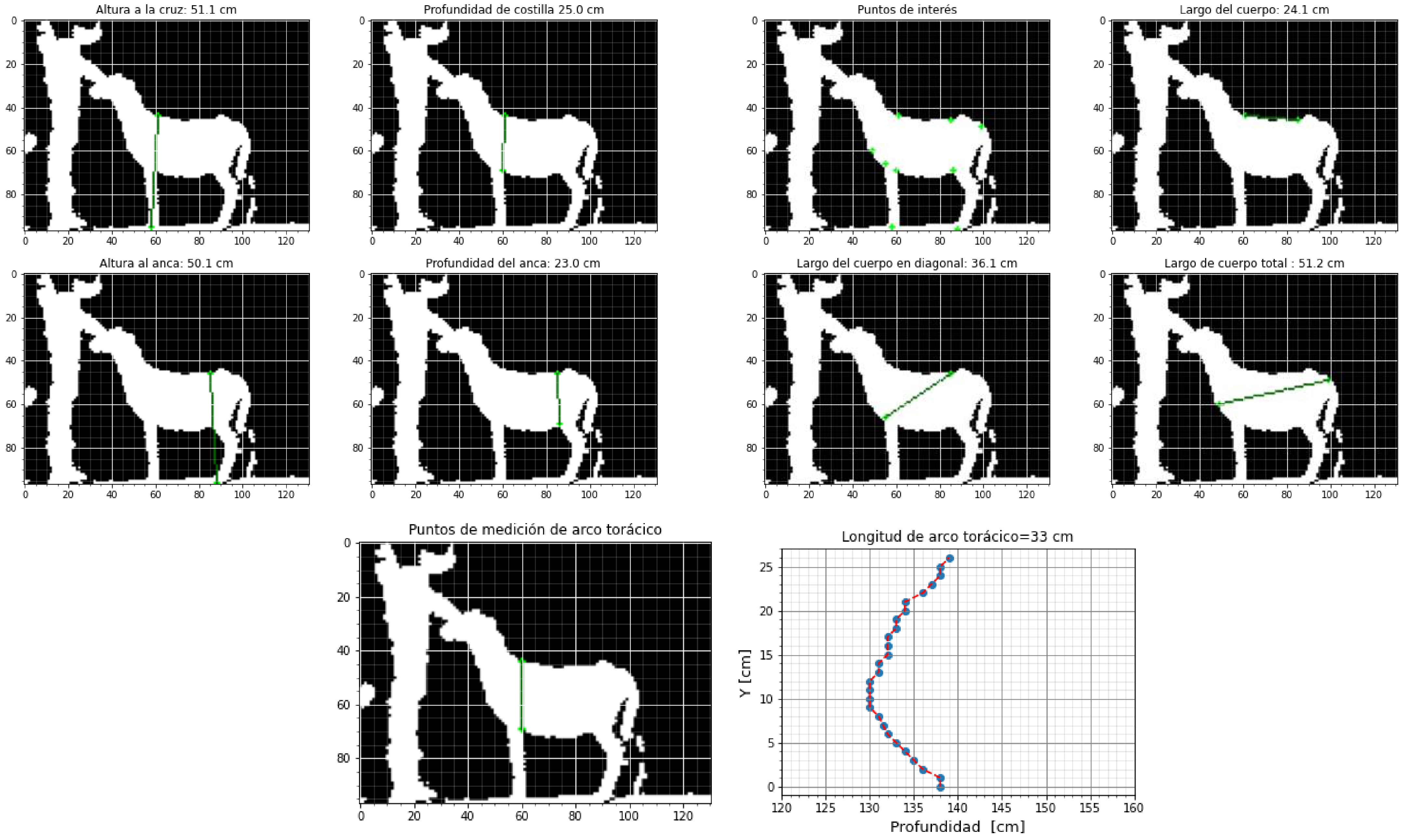

Altura a la cruz: 51.1 cm
Profundidad de costilla 25.0 cm
Puntos de interés
Largo del cuerpo: 24.1 cm
Altura al anca: 50.1 cm
Profundidad del anca: 23.0 cm
Largo del cuerpo en diagonal: 36.1 cm
Largo de cuerpo total : 51.2 cm
Puntos de medición de arco torácico
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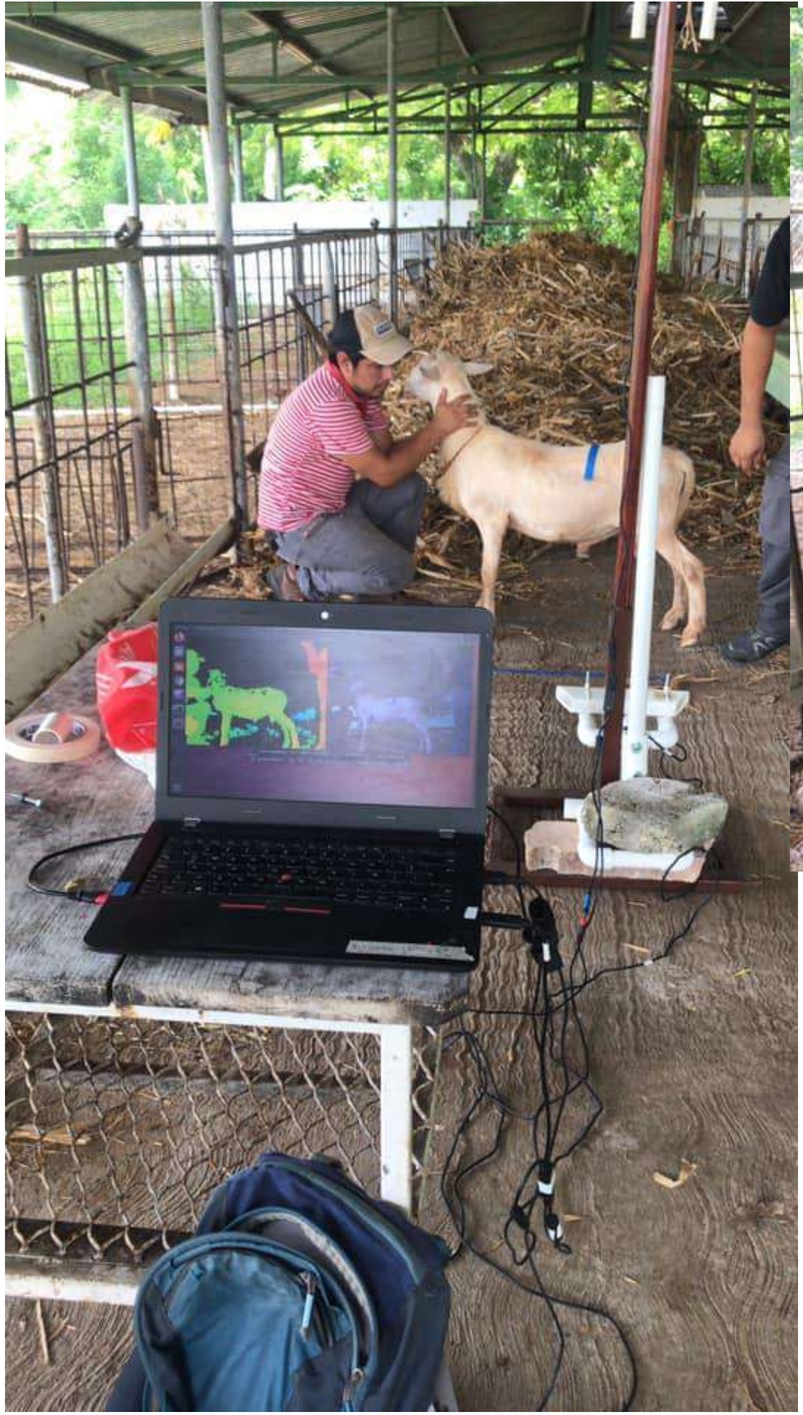
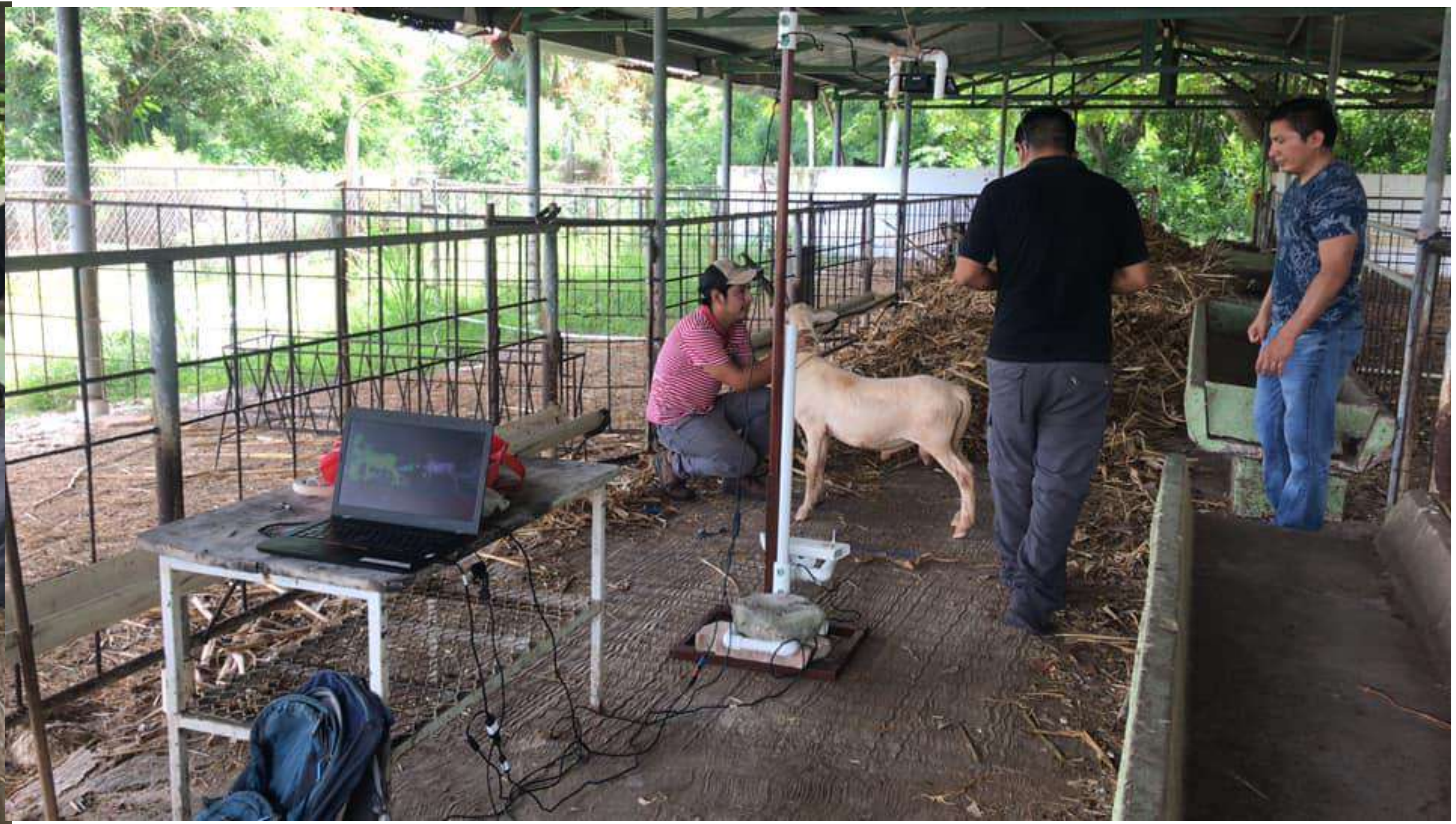
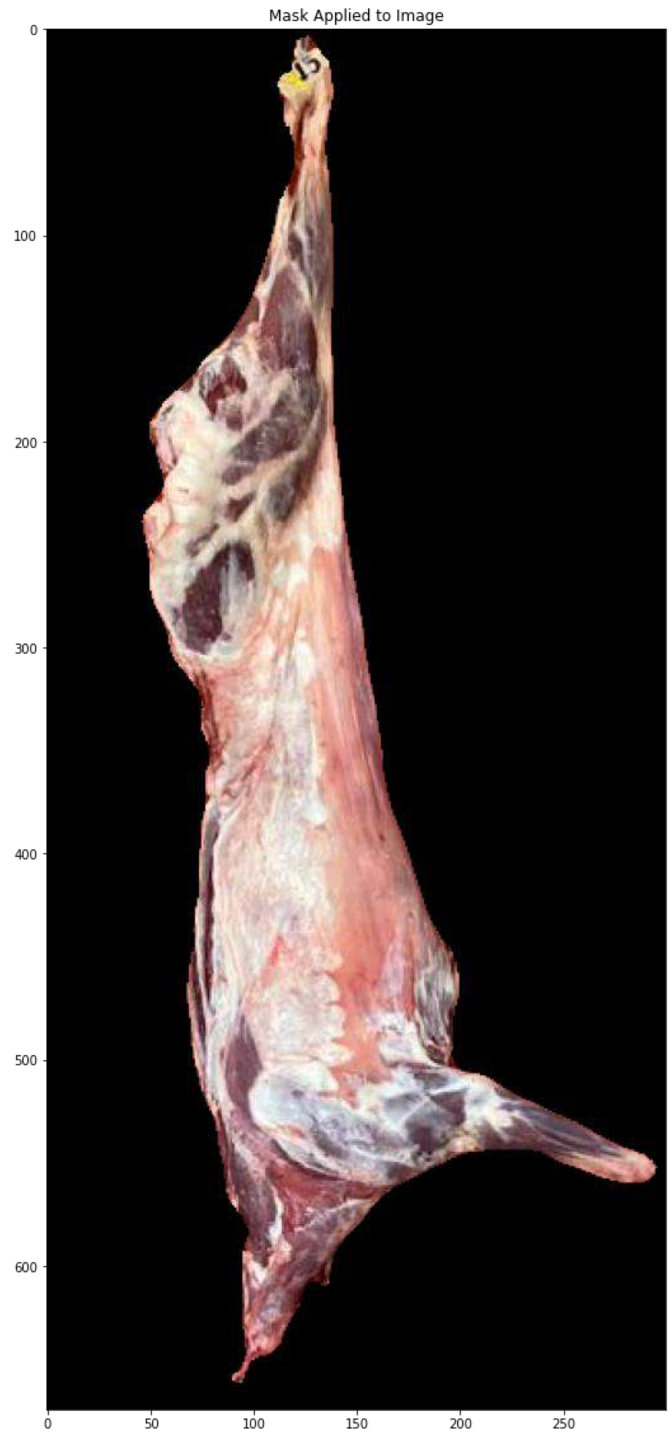
Y [cm]
Profundidad [cm]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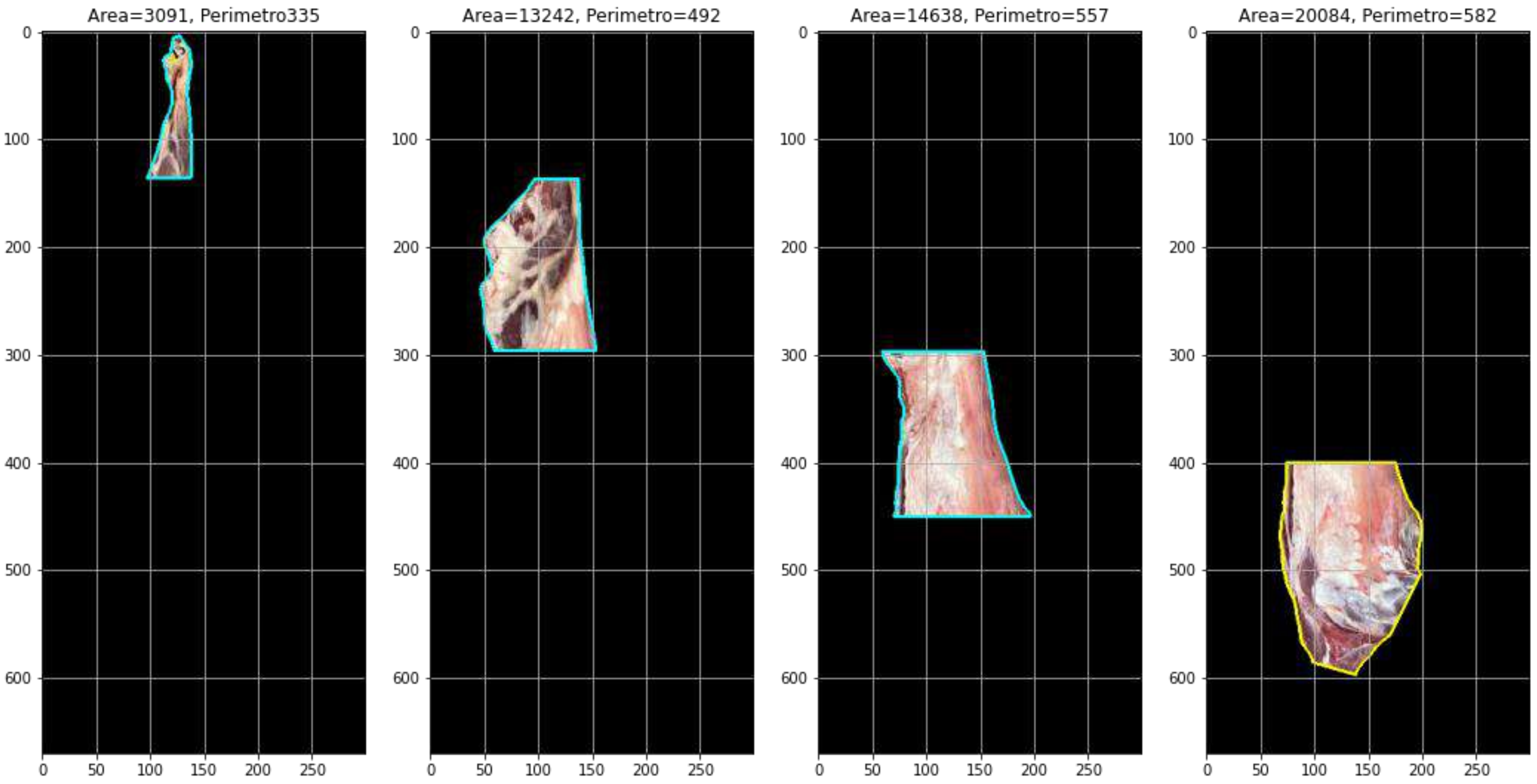
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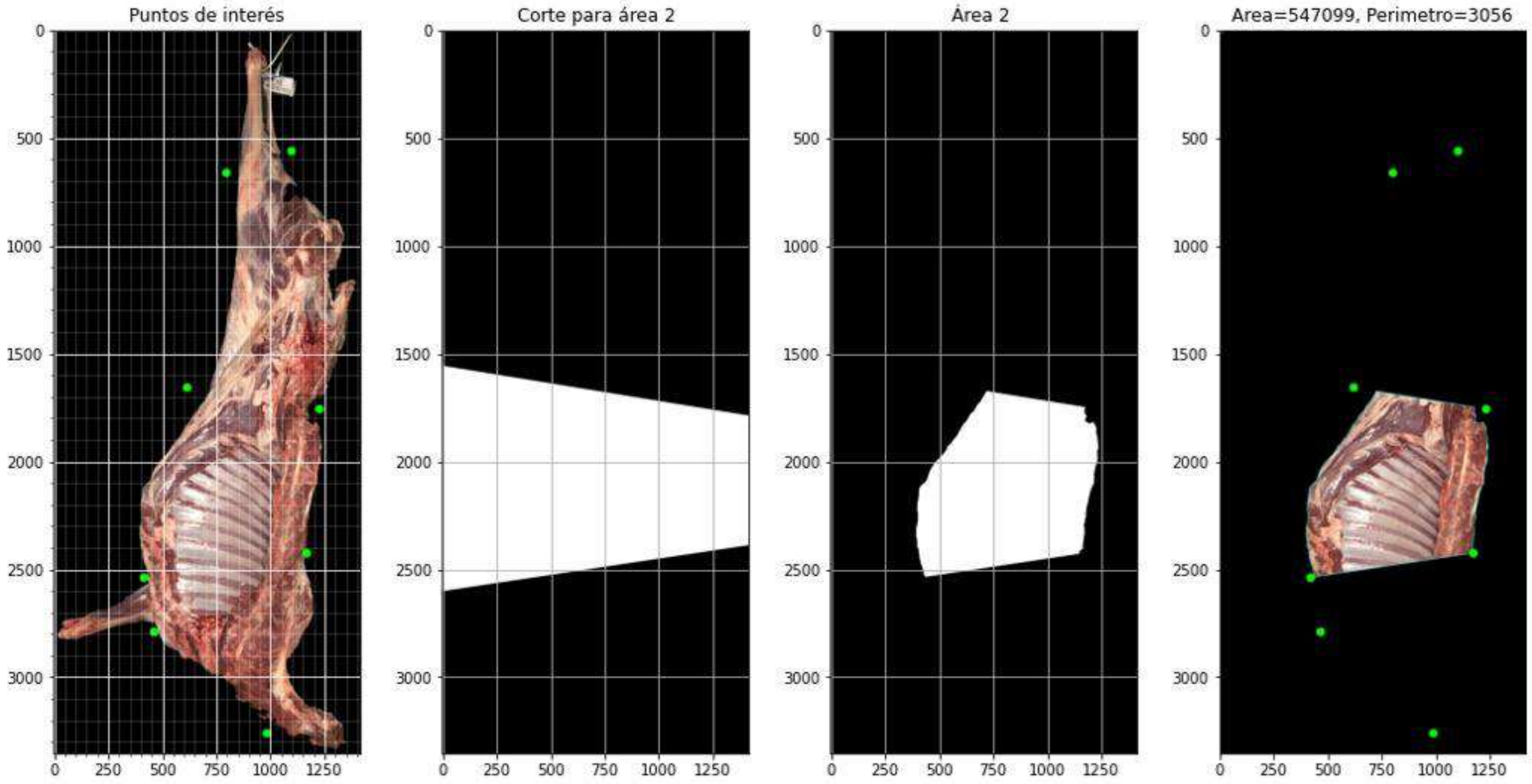
# Área 2



Puntos de interés
Corte para área 2
Área 2
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2500
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250
500
750
1000
1250

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