CROSSING BEEF CATTLE WITH CHIHUAHUAN CRIOLLO CATTLE IS AN EFFICIENT ALTERNATIVE FOR BEEF PRODUCTION ON ARID ENVIRONMENTS OF NORTHERN MEXICO

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Annual precipitation
- In dry environments, climate change aggravate conditions
  - Grasslands capacity is reduced
  - Higher costs of supplementation
- Inadequate or absent grazing cattle methods
- Deteriorated Chihuahuan grasslands with proliferation of invasive species
Finding ecological and economical alternatives of production is compulsory for local producers
- Reducing overgrazing
- Low cost beef production
- Acceptable for consumers
Rustic breeds advantages

- Adaptation to local conditions, tolerance to low nutrient contents, diversified use of pasture (Isselstein et al., 2007)
- Comparable meat quality (Vatansever et al., 2000; Liotta et al., 2011)
- Healthy fatty acids profile and antioxidants (Vatansever et al., 2000; Orellana et al. 2009)
Grazing Criollo cattle takes advantages of grasslands on an ecological way and produces healthy beef (Frederickson, 2005; Roacho et al., 2007; Anderson et al., 2015)

So, why not to use it pure?

- Prejudges
- Market (rodeo)
Angus and Criollo crosses

- Phenotypic characteristics similar to Angus
- Rusticity and adaptability characteristics (anecdotal)?
- To validate Criollo cattle on strategic crosses with Angus as an alternative for sustainable beef production.
  - To evaluate the use of grasslands and the grazing behaviour of Criollo, Angus and their crosses (females)
  - To evaluate productive parameters and feed efficiency of steers under extensive conditions and short indoors fattening (males)
  - To evaluate quality of meat, fatty acid and antioxidant profile of steers under extensive conditions and short indoors fattening
Animals
- 18 heifers (Six Criollo, six Angus x Criollo and six Angus) born and grown at the experimental site (adapted). Experimental farm from the University
- Twelve months old

Grazing site
- Highly diversified plant population
- Grassland dominated by Boutelouva hirsuta, B. radicosa and B. gracilis
- *Ad libitum* water availability
- Six days of constant monitoring in summer-fall and winter
- Every day two different heifers/breed were monitored
- Students with GPS (Garmin)
  - Localization
  - Activity (Standing (no activity), Laying (resting rumia), Walking exclusively or Grazing)
- Criollo and A x C graze > 1 hour more
- A x C and Criollo rest less than Angus on winter
Twenty-four steers (8 Criollo, 8 Angus x Criollo and 8 Hereford x Angus)

- Performance monitored for one year after weaning. Weighting animals every 2 weeks.
- Under regular management at the farm
- After one year on grazing system, animals went indoors
- Productive performance and feed efficiency measured for three months after one of adaptation
- Slaughter for evaluating; shelf life (colour), carcass characteristics, meat quality and tenderness
Weights on grazing system

- Grazing on irrigated cultivation
- Grain supplementation
- Pen with corn stubble
- Rain season. Grazing on natural lands
- Dry season. Low grass availability

Kg BW

December January February March April May June July August September October November November November December
- Indoors finishing
- 21 steers remaining (7 Hereford x Angus, 7 A x C y 7 Criollos)
- Why indoors?
Average:
- 0.036 in AxC
- -0.132 in Criollo
- 0.094 in HxA

Criollo had a trend to be more efficient

AxC seems to have slightly better trend than HxA
- **Carcass weights and yields**

  - Final weight: *Criollo=355kg, AxC= 392kg and HxA=412kg*
Carcass characteristics

- **Criollo**
- **Angus x Criollo**
- **Hereford x Angus**

**Graph Legend:**
- DF mm
- % KF
- Rib eye area (in2)
- Marbling
Thoughness on rib eye steaks

- Angus x Criollo: 13.68 Kg f
- Hereford x Angus: 17.95 Kg f
- Criollo: 23.88 Kg f

* Significant difference
• Criollo had some carcass traits comparable to European cattle and seemed to be more “efficient” on daily gain

• Angus x Criollo cattle showed remarkable good meat quality such as marbling, and better tenderness and colour conservation than H x A

• Remarkably, Angus x Criollo cattle kept beneficial characteristics from both Criollo and Angus, and seems a good alternative for beef production on deserted areas

• Is adaptation the key?
Thank you

QUESTIONS OR COMMENTS?