Desert Livestock Research Update

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UC CE | University of California
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Livestock Production in the Low Desert

- 2,000,000 cattle on feed
  - 350,000 in Imperial County
  - Holstein and crossbred cattle
- Replacement heifers
- Sheep
- Declining dairy

National Park Service

Livestock Research in the Low Desert

National Park Service

- Desert Research and Extension Center
  - Over 200 acres
  - Research feedlot

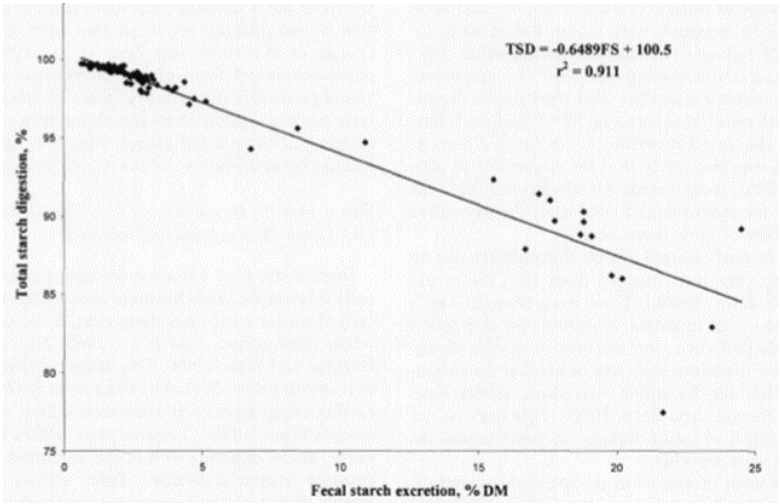
Sheep Research in the Low Desert

- Sheep graze alfalfa fields through the winter

- Weed control
  - Sheep select for weeds
  - As effective as herbicide
  - Non-grazed fields had higher yield due to contribution of weeds
- Insect pressure
  - Sheep will eat weevils and larva
  - May be beneficial for yields

Feedlot Research in the Low Desert

- Steam flaking feed corn
  - Increase in value of corn by 18%
  - 14.2 and 17.3% more NE_m and NE_g than dry rolled corn
  - Density and thickness of flakes important



  - Direct measure of starch concentration in feces can help determine adequacy of steam flaking for
  - Over 11 studies done on corn processing at DREC

Feedlot Research in the Low Desert

- Dietary energetics
  - As dietary NE increased:
    - DMI decreased
    - G:F, dressing %, and yield grade increased
  - As shrunk initial weight increased:
    - ADG, DMI, and shrunk final weight increased
    - G:F and dressing % decreased
  - Led to revision of energy requirement equations for feedlot steers and heifers

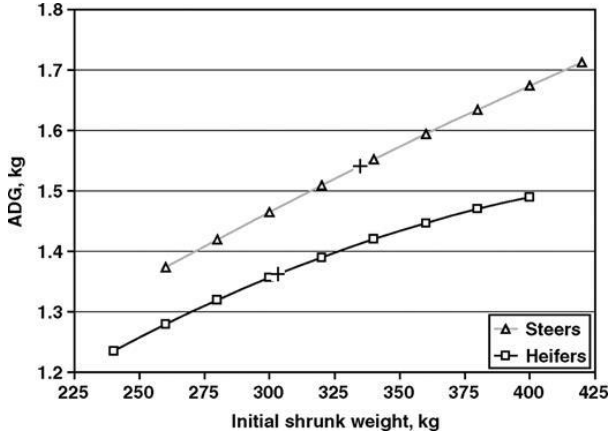
Table 6. Glossary of equations used for development of feedlot performance evaluation tools

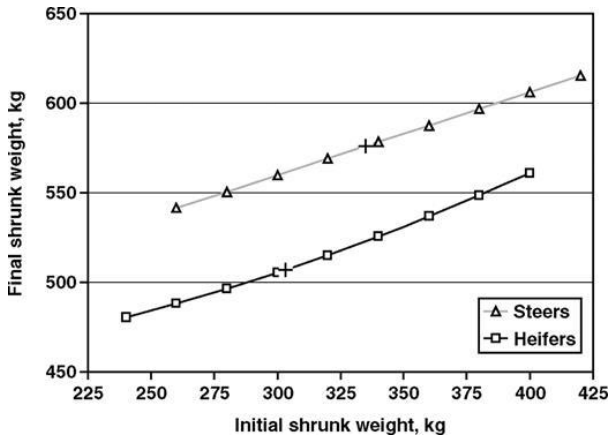
Variable[1]	Equation[2]
$MQSFW_{steer}$, kg	419.6 + 0.4619 SIW
$MQSFW_{heifer}$, kg	444.09 − 0.06018 SIW + 0.000881 SIW^2
$MQADG_{steer}$, kg	0.6664 + 0.003091 SIW − 0.00000143 SIW^2
$MQADG_{heifer}$, kg	0.4421 + 0.004336 SIW − 0.00000429 SIW^2
SFW_{steer}, kg	333.4 + 0.2534 SIW + 101.7 ADG
SFW_{heifer}, kg	420.9 − 0.6317 IW + 0.001557 IW^2 + 98.0 ADG
PQS	2 + (MQADG − $ADG_{observed}$)/(0.30 MQADG)
MFW_{steer}, kg	509.6 + 0.4697 SIW − 46.54 PQS
MFW_{heifer}, kg	551.5 − 0.2482 SIW + 0.00119 SIW^2 − 39.84 PQS
ADG_{steer}, kg	1.628 + 0.00287 SIW − 0.00000107 SIW^2 − 0.461 PQS
ADG_{heifer}, kg	1.265 + 0.00432 SIW − 0.00000425 SIW^2 − 0.410 PQS
RE_{steer}, Mcal	$0.0606 \times (LW \times 478/MFW_{steer})^{0.75}\ ADG^{0.905}$
RE_{heifer}, Mcal	$0.0618 \times (LW \times 478/MFW_{heifer})^{0.75}\ ADG^{0.905}$
EM, Mcal	$0.077\ LW^{0.75}$
Q	$[NE_m\ (DMI - (RE/NE_g))/W^{0.75}$
NE_m, Mcal/kg	$\{-[0.877\ EM + 0.41\ DMI + RE] - [(0.877\ EM + 0.41\ DMI + RE)^2 - (1.438 \times EM \times DMI)]^{0.5}\}/-0.82\ EM$
NE_g, Mcal/kg	0.877 NE_m − 0.410

[1]MQSFW = shrunk final weight for medium quality or average cattle (steer or heifer); MQADG = ADG for medium quality or average cattle (steer or heifer); SFW = shrunk final weight (steer or heifer); PQS = performance quality score ranking of 1 to 3, with 2 representing medium quality or average daily weight gain; MFW = mature final weight when cattle are expected to achieve 28% empty body fat; RE = energy retained; EM = maintenance energy expenditure; Q = maintenance coefficient.
[2]SIW = shrunk initial weight; IW = initial weight; LW = mean feeding live weight.

Feedlot Research in the Low Desert

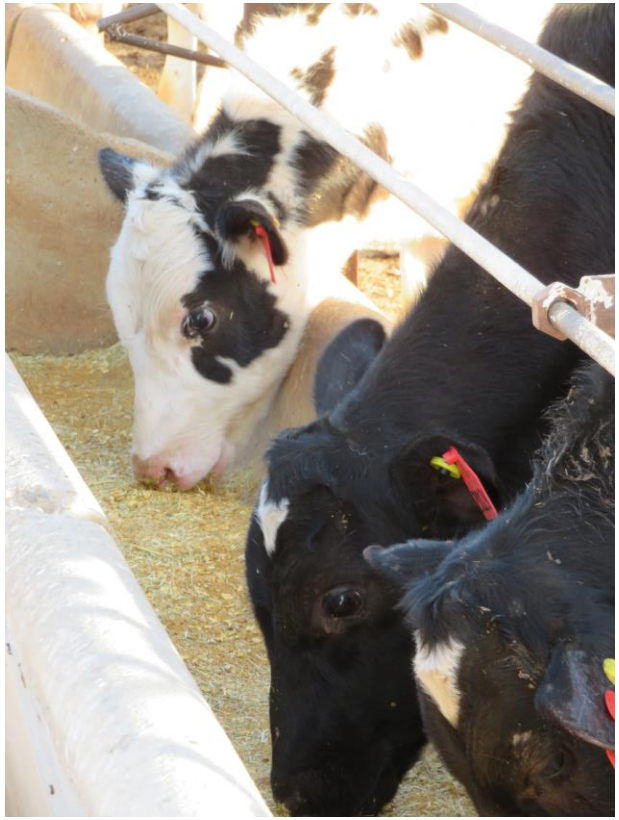
- Predictability of performance of Holstein feedlot animals





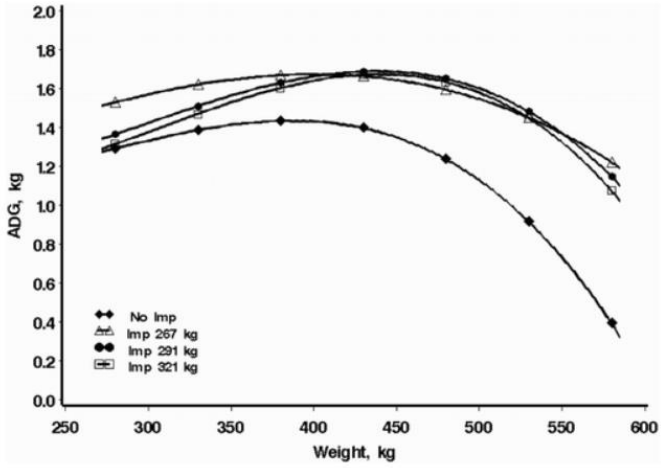
Feedlot Research in the Low Desert

- Management of new calves
  - Amount of available energy to feed on arrival
  - Amino acid supplementation in first 7 days for lightweight calves
  - Using yeast culture to reduce morbidity in newly received feedlot calves
  - Supplementing B-vitamins to decrease morbidity of high stress feedlot calves
  - Using rumen-protected amino acids to improve gain of feedlot calves



Feedlot Research in the Low Desert

- Implant strategies
  - Benefits of implantation on lightweight Holstein steers
  - Weight of animal at implant
    - Between weights of 267-321 kg, no performance difference
  - Duration of implants
    - Short duration with more frequent implantation better ADG than longer duration with less frequent implantation



Feedlot Research in the Low Desert

- Feedlot management
  - Using shade and feeding schedules to improve ADG and gain efficiency
    - Facilitate heat loss in evening hours
    - Decrease heat stress
    - Critical in low desert high temperature months

What's Next for Research in the Low Desert?

- More research on nutrition, management practices, etc.
- Huge backlog of information about desert feedlot management
  - Specifically for Holstein and crossbred cattle
  - Needs to be shared with producers

Questions?