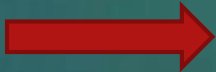




THE POSSIBLE USE
OF BETA AGONISTS IN
SMALL STOCK FEEDLOTS

DR ALNORA LE RICHE

- ▶ *Change in economical and political environment of livestock production*
- ▶ *Questions : How can enough protein be produced?
How can production be made more cost effective?
How do we ensure consumer safety?*
- ▶ *Much research in intensive beef production*  *high quality*



SMALL STOCK FEEDLOTS:

- ▶ *RELATIVELY UNPOPULAR IN SOUTH AFRICA*
- ▶ *TRADITIONALLY – LAMBS FINISHED EXTENSIVELY OR ON HARVESTED CORN FIELDS = INEXPENSIVE*
- ▶ *PROBLEM: SEASONAL AVAILABILITY*
- ▶ *PRICE FLUCTUATIONS IN LAMB MEAT MARKET*

CHALLENGES:

- ▶ **DECREASE IN NATIONAL SHEEP HERD** DUE TO PREDATORS , STOCK THEFT , DROUGHT
- ▶ **DWINDELING ANIMAL NUMBERS** → **SHORTAGE OF PRODUCT**
- ▶ **ESCALATION OF PRICES**
- ▶ **LAMB HAS BECOME AN EXPENSIVE SOURCE OF PROTEIN**

WHAT IS NEEDED :

▶ **CONSTANT SUPPLY** OF PRODUCT

▶ **PRODUCT THAT MEETS MARKET SPECIFICATIONS**

▶ **STABLE MARKET PRICES**

= SHEEP FEEDLOTS

IDEAL WORLD:

BALANCED RATION + OPTIMAL FEEDING CONDITIONS

+ OPTIMAL HOUSING CONDITIONS =

HIGH VOLUNTARY INTAKE =

OPTIMAL GROWHT =

PROFIT

A photograph of a feedlot with several sheep in metal pens. The sheep are white and appear to be in a state of confinement. The background shows the structure of the feedlot with metal railings and a roof.

▶ **HIGH COST** : FEED AND LAMBS

▶ FEEDLOTS = **LABOUR INTENSIVE**

▶ **RESULT** : **SMALL PROFIT MARGIN**

➤ **COST TO FINISH A LAMB IN 70 DAYS : R300-00 (FEED + PROCESSING)**

➤ **TOTAL PROFIT : AS LOW AS R50.00**

PROFIT MARGIN

= MEAT : FEED PRICE

**FCR CRITICAL : lamb that converts *feed*
into *muscle* in the most *efficient* way**

MOST PROFITABLE LAMB

FOCUS ON MORE EFFICIENT MEAT PRODUCTION



RESEARCH









RESPONSIBLE ,

EFFECTIVE USE OF GROWTH ENHANCERS

GOAL OF GROWTH ENHANCERS:

- 1)  FEEDING TIME
- 2) PRODUCE ANIMALS WITH  LIVE MASS
- 3) PRODUCE ANIMALS WITH HIGHER **MEAT : FAT**
- 4) MAINTAIN **OPTIMAL CARCASS GRADING**

STEROID HORMONE IMPLANTS:

- ▶ OESTROGEN - GROWTH HORMONE AXIS
 -  INSULIN
 -  THYROID HORMONE
- ▶ TESTOSTERONE - DIRECT ANABOLIC EFFECT
 -  CATABOLIC EFFECT OF STRESS
- ▶ OESTROGEN / TBA -  EFFECT
- ▶  PROTEIN ACCRETION =  GROWTH

BAR (BETA ADRENERGIC RECEPTOR AGONIST)

▶ *USE OF BETA AGONISTS* → *PART OF HEATED DEBATES*

▶ *REASON : POSSIBILITY* → *INAPPROPRIATE USE* →

ADVERSE EFFECTS FOR HUMAN AND ANIMAL

CONSUMERS

BETA AGONIST MODE OF ACTION:







- ▶ **MUSCLE HYPERTROPHY**  **REDUCTION IN BODY FAT**
- ▶ **NO SIGNIFICANT ALTERATION IN BONE AND ORGAN MASS**




REPARTITIONING AGENT

- ▶ **REPARTITIONING = CHANNELING OF ENERGY AWAY FROM STORAGE CELLS IN LIVER AND ADIPOSE TISSUE TOWARDS MUSCLE TISSUE**

EFFECT:

-  ADG (average daily gain)
-  FCR (feed conversion ratio)
-  WCM (warm carcass mass)
-  DP (dressing percentage)
-  CARCASS COMPACTNESS
- MAINTAIN MEAT QUALITY – LAMB
- **NO** SUBSTANTIAL  FEED INTAKE

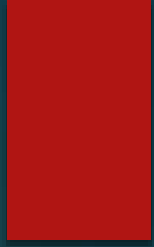
WHICH ANIMALS BENEFIT:

- ▶ **AGE COMPARISON STUDIES: MATURITY OF MUSCLE – CRITICAL**
= RECEPTOR PRESENCE AND AVAILABILITY
- ▶ **NO OR LIMITED RESPONSE IN YOUNG ANIMALS - YOUNG MUSCLE LACK ENOUGH BETA ADRENERGIC RECEPTORS**
- ▶ **LIMITED TIME OF RESPONSIVENESS : DOWN REGULATION OF RECEPTORS**
- ▶ **FED TO ANIMALS WITH OPTIMAL CONDITIONING SCORE DUE TO LIPOLITIC EFFECT**
- ▶ **SHEEP**  **LAST 18 - 25 DAYS**

SAFETY:

- ▶ **IMPORTANT TO KNOW AND OBSERVE WITHDRAWAL PERIODS**
- ▶ **FOUND BY VARIOUS RESEARCHERS – MIN 48 HOURS WITHDRAWAL – MRL IN CATTLE**
- ▶ **SHEEP : SAME WITHDRAWAL TIME USED**
- ▶ **RESEARCH - LABORATORY TESTS → 48 HRS = MRL**
- ▶ **72 HRS = NO DETECTABLE RESIDUES (↓ 1 p.p.b)**

POSSIBLE EFFECT: GROWTH DATA



<u>TREATMENT</u>	CONTROL	CONTROL + BETA AGONIST	ZERANOL	ZERANOL + BETA AGONIST	OESTRADIOL/TBA	OESTRADIOL/TBA + BETA AGONIST
FI	32.6	33.41	32.63	32.57	32.64	32.66
FCR	7.21	6.02	7.37	5.74	6.01	5.25
ADG	0.225	0.265	0.210	0.274	0.263	0.298

IMPROVEMENT:

- ▶ **FCR: 10%-20%**
- ▶ **ADG: 12% - 23%**



CARCASS DATA OBTAINED AT SLAUGHTER :

<u>TREATMENT</u>	CONTROL	CONTROL + BETA AGONIST	ZERANOL	ZERANOL + BETA AGONIST	OESTRADIOL /TBA	OESTRADIOL/TBA + BETA AGONIST
WCM	18.86	21.41	19.88	20.71	19.96	21.54
DRESSING %	0.48	0.50	0.48	0.50	0.47	0.49
CC	0.31	0.33	0.32	0.32	0.31	0.33

IMPROVEMENT:

▶ **WCM : 4% -14%**

▶ **DRESSING % : 4%**

▶ **CC : 6%**

FINANCIAL GAIN :

**DEPENDING ON HORMONAL
IMPLANT COST -
UP TO 5 % NETT GAIN
(R/c)**

CONCLUSION:

▶ **APPROPRIATE USE** - OBSERVING DOSAGE AND TREATMENT DURATION
RESTRICTIONS

▶ OBSERVING ADEQUATE **WITHDRAWAL TIMES** – **CONSUMER SAFETY**



POSSIBLE SHORTENED FEEDING TIME = REDUCED CARBON FOOTPRINT

- IMPROVED FCR
- INCREASED WCM
- INCREASED DRESSING %

SIGNIFICANT FINANCIAL GAIN FOR PRODUCER WHICH EXTENDS TO

MORE AFFORDABLE PRICES FOR THE CONSUMER



Win-Win Situation