FINAL EXAM

Tips from Russel: A difficult exam with everything covered.

- 10 short answer questions (5 marks each, 6 mins/ question)
    - At least 5 points (ideas) in order to make the marks
    - ‘Dot point’ is acceptable
- 2 short essay questions (15 mins each)
    - ‘Dot point’ is okay when running out of time
- Total of 2 hours (+10 min reading time) —> time management is important

Hints:

1. If you are asked to list and describe different vectors that may impact production —> make sure they are DIFFERENT!
    - rainfall, temperature, humidity = ONE vector = CLIMATE/ ENVIRONMENT
2. Do not exclude the experiences/ examples (grazing trail, Arthursleigh excursion and Wagga)
3. *Answer - explanation and justification*

“Pens with different sizes to prevent cramps,” (RUSSEL 2019).

Week 1: History of the Aus Merino

Learning outcomes:

1) Understand history of Merino sheep in Australia. → just need to know briefly!
2) **Describe** the **three (3) main strains of Merinos** in Australia and t**he environments to which they are best adapted.**
3) Realise the **difference between wool, meat and dual purpose sheep enterprises**. → provide examples

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1) Understand history of Merino sheep in Australia. → just need to know briefly!

History

- First started around 9000BC
- The need for domestication was driven by colder climatic conditions
- Nomadic lifestyle of hunting and foraging changed to a more **village lifestyle with associated farming** in which animals are kept for **meat, skins, dung (fuel), milk and hair/ wool**.
- There is evidence of sheep being selected for **meat and fibre** (sheep wool consists of: **kemp and underwool**)
    - There was also a preference for **whiter fleeces over the black/ brown ones**
    - First attempts to **dye wool** using natural dyes around 2000BC
    - First evidence of shearing sheep around 1000BC (suggesting that wool grew year-round in these animals)

Spanish influence

- Spain is dry (68% with less than 600mm annual → similar to Aus), mountainous and with large areas of natural pasture
- 1100AD Great nomads (Christians): developed **stock routes**
- 1300AD Muslims (Berbers): Superior finer softer wool from Nth Africa
- 3.5M sheep in 15th century
- **Merino name first appears**

Sheep development in Spain

- **Plainer and smaller** than current Merino (around 40-50kg mature)
- Cut 1.7-2.5kg wool
- 5cm crimped staples (the closer the crimp = the finer the wool)
- Greasy black tip
- **Good forager**
- **High repro rate in harsh env**
- **High worm resistance**
- S:P ratio (secondary to primary follicle ratio[1]) not similar to today's Merino
- Micron:
    - Rams: 20-29µm
    - Ewes: 18-27µm
- Loose skin
- "Spanish sheep" gained prominence by the early 90th century - notably in England, Saxony (S E Germany), France and America.
- Away from Spain the Merino changed due to **differing climate conditions and selection pressures**.
- **Saxony sheep** were noted for their **fleece**, being **extremely fine and white in appearance**.
- The **French** had concentrated on **carcass development with less attention to wool quality**.

Saxon sheep noted for:

- High fleece weight, high fleece density, higher BW, adaptability to cold dry climate and **exerted a great impact on the Australian industry**

Potential disadvantages:

- Small closed pop rapidly lose their hybrid vigour (solution: introduction of outside animals)
- Can we make greater progress with a popular purebred with a large genetic base? - Not really due to the lack of genetic diversity → once the consumer preference changes, pretty much die off?

Northern and Southern Ausrtalian production systems

Southern zone	Northern zone
- Predominant winter rainfall - Moderate but variable ambient temp and variable humidity - High quality pastures - No cattle ticks - Calving time: MAR-APR - Farms in southern areas are generally more intensive than their northern counterparts. - **Farmers in this area generally run European and British breeds which are kept for their ability to gain weight and produce favourable quality meat. After being slaughtered at varying ages, meat from these cattle is typically sold into high value markets. These include; Korea, Russia and Japan.**	- Predominant summer rainfall - High ambient temp and humidity - Moderate to low quality pastures - Water availability is a problem - Cattle rick prevalent - Calving time: NOV-MAR - **Beef from these cattle is of lower quality compared to southern beef. Thus the northern area targets the Asian market through live exports. Alternatively, cattle are sent south where they are fed grain before slaughter. At which point, the beef is boxed and sent to countries such as America as 'hamburger' meat.**

Northern zone with a **larger average area (ha) and higher number of beef cattle** but with a l**ower proportion of national beef production (only 24%)**. On top of that, as there is a much larger operational scale in Northern zone, they have defined class groups different to that in Southern zone (see the table below).

There is a higher beef cattle death rates in Northern Australia compared with Southern Australia.

- This could be due to
    - Northern cattle: remote area (harder to monitor = higher chance of mortality)
    - Southern: more frequent monitoring (better survival)
    - Peak during 1982-83 could be due to climatic factors (seasonal issues)
- There is a higher branding rates in Southern Australia (for management)

Cattle price often fluctuates, so does the cost of production. But there is now an up-going trend (parallel) of both production cost and price received.

Criteria for domestic and export markets for beef as well as how animals are assessed

<u>Market</u>

Beef consumption - domestic market:

- Ausrtalians eat 26kg/ person in 2017-18
- ARound 95.7% of Aussie households buy fresh beef
- Beef had the highest share of fresh meat sales in 2017-18 at 35%

Australia's export markets

- Australia exports ~71% of total beef production to 78 countries (Jap & US: largest markets) → the total value of exports is $8B

How animals are assessed:

Cattle marketing

- Progressive producers will evaluate: the genotype of their cattle, the feed resources available and key environmental factors to **determine the most appropriate market for their cattle**
- Merely sending cattle to **auction** in the hope of receiving a reasonable price is unlikely to max returns for the farmer
- Basic specifications for slaughter markets are described in terms of **carcase weight (kg) & fatness (mm at the rump site)**
    - Most markets also specify: **sex, age, residue status, meat colour, fat colour, marbling and hormonal growth promotant status.**
        - Most hormonal promotant is natural hormone → better feed ratio (promote weight gain and muscle growth)

Carcase weight

- **Frame scoring**
    - The height of a beef animal at a given age can indicate its maturity type, or growth curve potential
    - May assist in **determining where animals best fit a breeding program** (vealers or steers)
    - Also used to **predict growth and fattening pattern as well as its mature size** → for selecting stock
- Best prediction of weight and performance of progeny obtained by using weight records = **Estimated Breeding values (EBVs)**
- Heavy muscle beef: Belgium blue (double muscle), Charolais, Limousin
- Moderate: Angus
- Lightly muscle: dairy cow (milk production instead of muscle)

Fatness

→ Meat with a **high fat content** is generally **preferred**

- **Visual fat assessment**: less accurate than manual assessment (feeling the animals) → can be a reasonable estimate of fatness
    - 2 main factors associated with cattle appearance and shape: **muscle and fat**
- **Manual fat assessment**: a more accurate assessment → feeling for fat deposits with the tips of your fingers (feels a bit like spongy when you put pressure)
    - Assessments are made on the live animal at positions where fat can be more readily differentiated from muscle

Criteria for domestic and export markets for beef:

Australia produces beef for a wide range of domestic and export markets.

- The Australian beef industry aims to grow an animal to market weight and then convert it into a product desired by the consumer in both the domestic and export marketplace

DOMESTICS

Local and supermarket

- Vealer or yearling steers and heifers 9-15mths finished on good quality pasture or feedlot for 70-90 days.
- **Local butchers usually prefer lighter carcasses (250-300kg liveweight) while supermarket cattle can weigh up to 400kg liveweight.**
- Trend towards heavier weights for lot-fed.
- Virtually all breeds and crosses are suitable, including dairy crosses.
- Cattle suitable for these markets may also be suitable as feeder steers, depending on breed, weight, maturity type and condition

Hotel, restaurant and institution

- Yearling and 2-tooth cattle (2yo), mainly steers and in the range of 400-520 kg LW