

Sustainable intensification of the SE Australia beef and sheep industries – on-farm

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The Primary Industries Climate Challenge Centre is a joint venture between the University of Melbourne and the Victorian Department of Environment and Primary Industries



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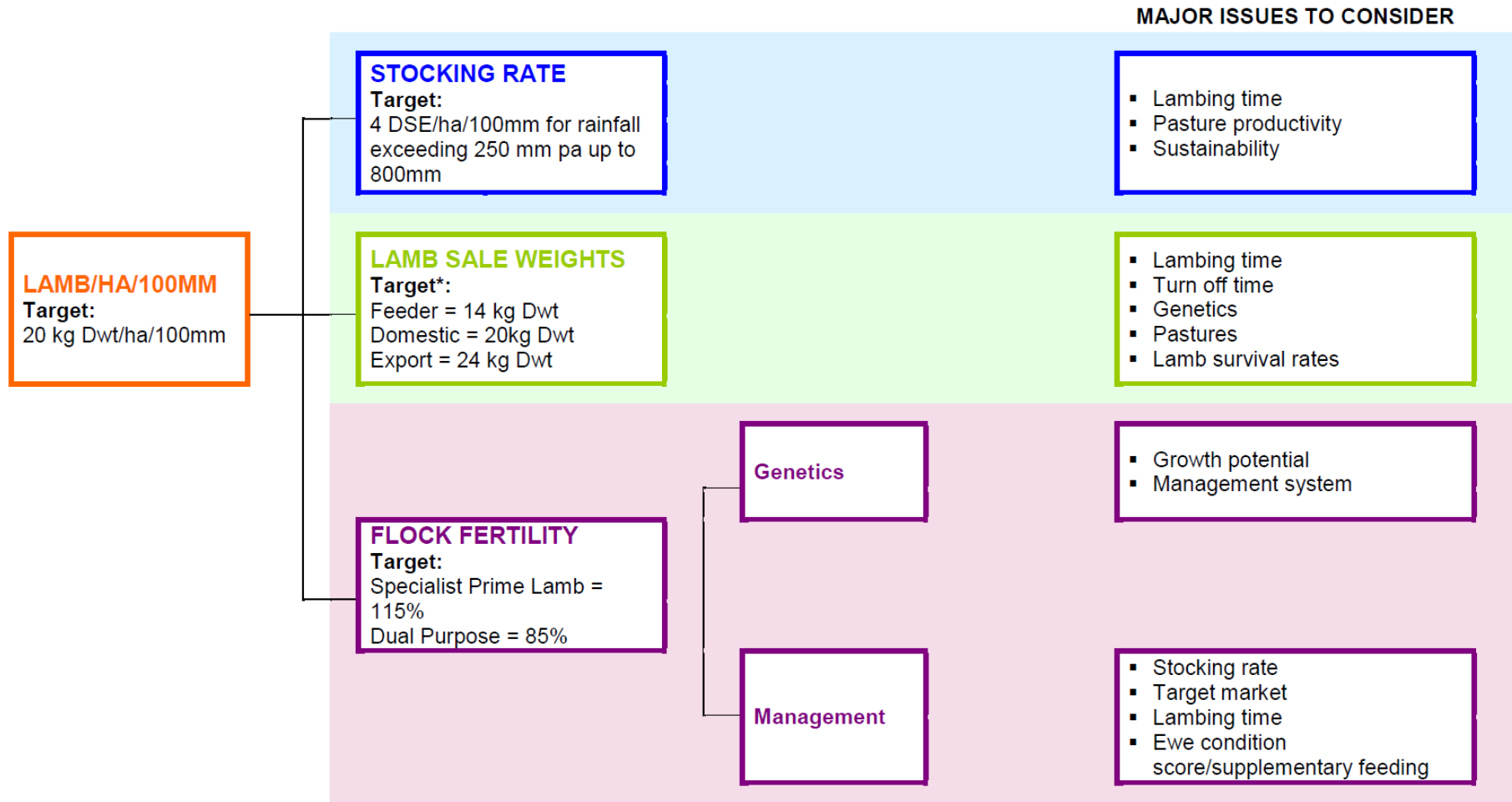


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Prime Lamb 2014

Figure 2.2: Factors that influence per hectare production of lamb



*Note: These are suggested optimums. Producing heavier lambs in many cases may reduce overall profitability due to the high cost of additional kilograms

Southern Beef 2014

MAJOR ISSUES TO CONSIDER

BEEF/HA/100MM
Target:
40 kg Lwt/ha/100mm

STOCKING RATE
Target:
4 DSE/ha/100mm for rainfall
exceeding 250 mm pa up to
800mm

- Calving time
- Pasture productivity
- Pasture quality

AVERAGE SALE WEIGHTS

- Calving time
- Age at sale
- Herd Structure
- Genetics
- Pastures

HERD WEANING WEIGHT

Management

- Average calving date
- Dystocia rates
- Cow condition score/supplementary feeding

Genetics

- Growth potential

Figure 21: The most important factors that influence per hectare production of beef are stocking rate and average sale weight

Core Principles - 2050

- Research has improved the input : output efficiency of beef and lamb production through
 - Improved pastures and feeding systems
 - Fertiliser efficiency – P, N, K
 - Genetics & Genomics
 - Reproduction
 - Animal welfare and individual animal management
 - Precision resource management and monitoring
 - Climate change
 - Integrated supply/value chain





Pastures & Nutrition

- Improved grazing systems, measure & manage
 - Measurement of intake, nutritive value, growth
- New pasture cultivars
 - improved (and balanced) nutritive characteristics for improved feed conversion efficiency
 - agronomy - establishment/persistence
- Specialist forages and dual-purpose crops
 - Increased dry matter and nutritive value
 - Key times - autumn/winter & summer
 - herbicide tolerant crops in rotations with pastures



Nutrient & Water Use

- Fertiliser – precision management of P, N, K
 - Fertiliser efficiency critical with more specific prescriptions over pastures/paddocks
 - P and N efficient pastures, cultivars and mixes
 - Nitrogen use efficiency & winter growth
- Water efficient, summer green and drought tolerant pastures
 - Techniques to increase plant available water holding capacity of soils
 - Promotion of deeper rooting of pastures & cultivars



Animal Genetics & Genomics

- Increased feed efficiency
- Ewe reproduction and lamb survival
- Lean meat yield whilst maintaining or improving meat eating quality
 - Intramuscular fat, shear force, colour, flavour, odour
- Easy care (worm and fly strike resistance)
- Accelerated genetic improvement
 - Jivet, 3 lambings per 2 years
- Genotype by environment management



Reproduction & Growth

- Substantial increases in reproductive rate and survival (sheep) – 150% weaning rate
 - Through twin and triplet management
- Ewe lamb breeding – 130% weaning rate
- Seasonality of breeding decreased
- Weight of weaned lamb per ewe per year
- Lactation management for improved growth
- Beef twinning, management, feeding, genetics



Animal Health & Welfare

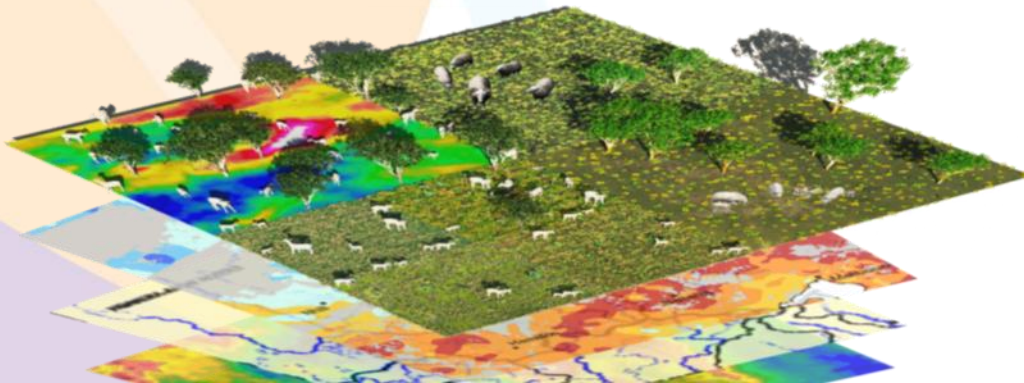
- Automated and remote monitoring of animal health and welfare
 - Behavioural and physiological indicators
 - Alert systems and recommendations
- Individual animal management
 - Growth, condition score, worm burdens, etc
- Farm systems, shelter and virtual fencing
- Conventional shearing replaced with alternatives





Precision Management

- Sensor and measurement based technologies record key variables through wireless networks
 - pasture growth, nutritive value, soil moisture, water
- Precision farming technologies and decision support based on a data rich environment
 - integrated and real-time to facilitate management and decision making
 - including alerts and forecasting to manage risks





Climate Change

- Tackled as an adjunct to addressing productivity;
 - Increased use of perennial and summer active pastures
 - Winter and spring growth
 - Increased forage conservation and dual-purpose crops
 - Time of lambing/calving
 - Shade and shelter design for heat stress
 - Containment areas and pasture destocking
 - Stock water security & quality
 - Emissions intensity reduced





Integrated supply chain

- Inventory management
- Animal health and welfare monitoring
- EID linked data and information transfer
- Feedback on all individuals
- Provenance stories and assurance





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