Making More From Sheep

A joint initiative of





Lamb Weaning and

Nutrition





Liveweight at weaning and survival



Weaner Li	veweigh	t	S. Start La			1964	12237			100	
		10 kg		15 kg		20 kg		25 kg		30 kg+	
Growth target	M/D	Feed g/d	Protein %	Feed g/d	Protein %	Feed g/d	Protein %	Feed g/d	Protein %	Feed g/d	Protein g/d
Maintain weight	8					510	8.7	590	8.7	680	8.7
	9	Feeding to maintain weaners below 20 kg is not recommended				440	9.5	510	9.5	590	9.5
	10					380	10.0	450	10.0	510	10.0
	11					340	10.8	400	10.8	450	10.8
	12					300	11.5	350	11.5	400	11.5
	13	1			270	12.5	320	12.5	360	12.5	
50 g/d	10	350	14.5	450	13.0	560	11.8	610	11.1	770	10.4
	11	300	16.3	400	14.0	490	12.9	580	12.0	660	11.6
	12	260	18.7	350	15.4	430	14.0	510	13.0	580	12.5
	13	240	19.5	310	16.7	380	15.2	450	14.1	510	13.6
100 g/d	11	420	17.9	540	15.1	660	13.5	780	12.3	880	11.7
	12	360	20.2	460	17.0	570	14.9	670	13.6	760	12.8
	13	330	22.4	410	18.4	500	16.3	590	14.7	670	13.8
150 g/d	12	470	20.5	590	17.5	710	15.5	840	13.8	950	11.8
	13	420	23.4	510	19.5	620	16.9	730	15.1	830	13.9

Table 14. Predicted feed and minimum protein requirements for merino weaners

A balanced ration <u>must</u> provide:

Energy
Protein
Roughage
Vitamins and
Minerals



Pasture - Digestibility and Energy Deficits



As a general guide:

- 70-80% digestibility is required for high livestock production;
- 60-70% digestibility is required for moderate production and
- 55-60% digestibility is required to maintain dry stock.
- Below 55% digestibility, dry stock will lose weight.



Relative energy value:

Carbohydrate Protein Oil 15-18 Mj/kg DM 22-24 36-40

Excess protein can be used. Oil is a rich energy form but there are limitations.

Protein is needed for:

- muscle development,
- appetite and
- wool production

Inadequate protein

- a reduction in gut bacteria,
- digestion slows and
- intake drops

Energy and protein need to be <u>balanced</u> to achieve optimum growth/production results





Wheat Triticale

Corn Sorghum

Barley Peas and Beans Cottonseed Oats Lupins

Lower in starch Higher in Fibre Higher in Oil

Higher in starch

Lower in Fibre

Acidosis Risk



Consider training to grain

There are benefits associated with pre-training lambs prior to weaning

Doing so can lead to a lifetime recognition and increased acceptance of grain

Percentage Eating (Days 1 and 5)



Green et al (1984)

Pulses

	Chickpea	Cowpeas	Faba Beans	Lupin (Ang)	Lupin (Alb)	Mung Bean	Navy Bean
ME	13.3	13.4	12.8	13.2	13.2	13.2	11.7
Crude protein	22.1	24.9	29	33.8	43	25.8	24.8
Crude fibre	10.5	5.8	9.1	16.1	16.3	6.3	5.2
NDF	22.8	16.6	15.9	25.6	24.4	15.6	20
ADF	13.8	6.5	10.7	20.9	20.1	8.5	7.6
Ether extract	5	1.6	1.4	6.1	5.4	1.9	1.7
Starch	35.6	47.8	44.7	4 <mark>.</mark> 7	6.9	47	42.7
Total sugars	3.6	4.6	3.6	5.8	5.1		4.9
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Са	1.7	1.2	1.5	2.7	2.9	1.6	2.5
P	3.9	4	5.5	3.5	9.2	4.5	4.9
К	11.9	15	11.5	9.3	9.5	9.6	16.9
Na	0.2	0.1	0.1	0.5	0.5		0
Mg	2.1	2.3	1.8	2	2	2.2	2.2

Processed Meals

	Copra Meal	CSM	СМ	SFM	Soybean Meal	
ME	13	13.2	11.7	9.1	14.7	
CP %	23.5	45	39	32.4	49.3	
CF %	16.8	10.6	12.8	27.9	4.9	
NDF	56.4	23.7	26.9	45	11.1	
ADF	30.7	15	18.8	32	5.9	
Lignin	8	5.4	7.9	10.7	0.5	
EE	2.8	8.9	4	2.2	7.7	
Ash	7	7	7.8	7.1	6.8	
Sugars	11.4	4.6	10.5	6.1	9.3	
Ca	0.7	2	7.4	4.4	4.6	
Ρ	6.5	12.4	11.6	11.6	7.2	
К	22.8	16.6	13.7	16.9	21	
Na	0.6	0.3	0.5	0.1	0.2	
Mg	3.3	6.3	5.7	5.6	3.2	
200				*solvent extracted		



Sheep require many minerals, although most are needed in only small amounts

Of the major minerals calcium, sodium, phosphorus and magnesium are most important



If we look at what minerals are available in common feedstuffs we see that:

- Cereals are low in calcium and sodium
- Pulses and meals are ok in most minerals
- Fibre helps with Mg and K intakes
- Many forages may have low Ca, Mg, S and Na contents

- An enzyme cofactor involved in metabolism of CHO's, lipids & protein
- Roles in nerve conduction and muscle contraction
- Approx 70% stored in skeleton but is poorly mobilized by adult sheep

<u>Magnesium</u>

High intakes of

- K, Ca, P, N and Organic Acids <u>decrease</u>
 Mg availability
- Na and carbohydrates <u>increase</u> availability

Excess Mg causes damage to rumen, scouring, reduced feed intake etc





EFFECT OF SUPPLEMENTS ON WEIGHT GAIN



CONTROL TO FABSTOCK



Vitamins

<u>Vitamin A</u>

- bone development,
- Cell regulation and
- light transmission

<u>Vitamin E</u>

maintaining cell membranes

<u>Vitamin D</u>

regulate Ca:P balance

Vitamin B12

Cobalt is converted to B12 in the rumen and is stored in liver

Needed for

- cell growth,
- energy (glucose production) and
- wool production (metabolisation of methionine)

Vitamin B12

Rate of absorption (in SI) is

- <u>enhanced</u> by slow gut flow
- <u>inhibited</u> if rumen or SI damaged

Colostrum (some) but milk (limited) Vit B12

Fibre

- stimulates and cleans rumen walls
- encourages cud chewing (35,000 x/day)
- maintains rumen motility
- reduces acidosis risk
- diverts P from urine to manure improving Ca:P balance in urine (reducing bladder stone risk)
- If 40% + are 'cud chewing' at any one time fibre level is adequate

Fibre

- reduces rate of gut flow increasing B12 absorption
- improves Mg availability and absorption
- provides additional Vitamin D

Check manures (appearance, grain, mucus, gas bubbles)

Manure's 3 C's – Colour, Consistency and Content





Vaccinations/Drenching

- 5 or 6 in 1
- A,D,E and possibly B12
- Control worms damage to rumen or small intestine from worms will reduce
 B12 absorption and overall productivity

Scouring

There are many factors that may cause

- scouring don't always blame worms
 - High moisture feed
 - Acidosis
 - Low effective fibre (low DM's)
 - Excess protein to small intestine
 - Excessive Mg

Commonly

Used Additives

<u>Urea</u>

- NPN converted to ammonia and used to produce microbial protein (significant protein source for lamb)
 - need adequate energy in ration, may need to supplement with K and S dangerous

Bentonite

a clay, swells to 6-7 times size in rumen slowing gut flow
 binds acid ions, reduces protozoa (consume gut microbes)

Bicarb of Soda

- naturally produced by lamb when chewing
- buffers against acid production

<u>Salt</u>

a sodium supplement, increases water/ration intakes



Molasses/Vegetable Oils

- energy source, improves palatability and reduces dust.
- Sugars yield less microbial protein but can increase the extent of ruminal fermentation

Limestone

· Ca supplement, some buffering action in SI

Acid Buf

- Seaweed extract with 4 times buffering ability of bicarb and buffers for longer period within the rumen
- Releases Ca and Mg, can be used to replace limestone, bicarb and causmag



Acid Salts (NH4CI, CaCl², (NH4)² SO4 etc)

Mobilises Ca from small intestine, acidifies urine, may help with prevention of bladder stones but bitter

lonophores (eg: Bovatec)

- A coccidiostat that depresses or inhibits the growth of high acid producing microbes and protozoa
 May improve feed conversion efficiency <u>but</u> may reduce
- May improve feed conversion efficiency <u>but</u> may reduce intake
- 25-70g per tonne of feed so usually as a pre-mix

Virginiamycin (Eskalin)

An antibiotic, need veterinary approval (S4) Prevents multiplication of lactic acid producing bugs