

Carcass performance and meat quality of lambs born on Whenua Haumanu farmlets in 2022 and 2023

Research questions :

- Can diverse swards compared to standard sward influence lamb growth and carcass performance?
- Does a diverse swards compared to standard sward have an impact on lamb meat quality?

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Method

- Lambs were with their dams on the Wenhua Haumanu farmlet treatments
- At weaning (December) lambs from each treatment move to the PCRU (separate from Wenhua Haumanu farmlet) to remain on either standard or diverse pasture until slaughter (March/April).
- The lambs were weighed (directly of the pastures i.e., a full weight) at weaning and the day before slaughter.
- The hot carcass weight was obtained at processing.
- The left saddle loin (*Longissimus lumborum*) was obtained from each carcass, aged for 14 days (4°C in vacuum pack) and used for objective meat quality tests of ultimate pH, meat colour, measures of water holding and shear force.
- ANOVA using PROC GLM (SAS 9.4) with the fixed effect of treatment.

Lamb growth and carcass

2022 born, 2023 slaughtered

Postweaning pasture	Standard	Diverse	P-value
Number of lambs	11	11	
Final liveweight (kg)	39 ± 0.9	49 ± 1.0	<0.001
Liveweight gain (wean-slaught; g/day)	85 ± 7.1	156 ± 7.8	<0.001
Carcass weight (kg)	15.7 ± 0.6	20.2 ± 0.6	<0.001
Dressing-out (%)	39.4 ± 1.2	41.7 ± 1.3	0.213

2023 born, 2024 slaughtered

Prewean treatment	Std-Conv	Std-Reg	Div-Conv	Div-Reg	P-value	P-value
Postweaning pasture	Standard		Diverse		Prewean	Postwean
Number of lambs	12	12	12	12		
Final liveweight (kg)	43.8	44.3	43.3	46.7	0.093	0.336
Liveweight gain (wean-slaught; g/day)	74.2	68.1	51.3	69.1	0.209	0.178
Carcass weight (kg)	16.9b	18.0ab	17.4b	19.7a	0.017	0.093
Dressing-out (%)	38.6b	40.3ab	40.2ab	42.1a	0.028	0.042



Insights & implications of growth & carcass results

- The 2022 born lambs that were on diverse pastures after weaning had better growth performance but not evident with the 2023 born lambs, with preweaning treatments giving differences in growth performance, most evident with carcass weight.
- Previous research as identified that a forage mix has a higher digestibility and a nutritive value that is better matched to growth requirements compared to a perennial ryegrass pasture (Somasiri et al 2015)
- Results from 2023 born lambs suggests more benefit of having lambs on diverse swards while they are at-foot. Potential synergistic effect of ewes milk production and ability to graze a pasture that meets the nutrient requirements for early lamb growth.
- The results from 2023 born lambs shows an additional advantage on growth of the lamb carcass with regenerative management. If stocking rates differed (need to check), this may indicate less competition between the ewe and lamb on a sward that allows for selection for the best nutrients for growth (Provenza et al 2003).
- Potential further research: understand the influence that diverse swards or regenerative management has on diet selection by lambs and on ewe vs. lamb competition.



Lamb meat quality

2022 born, 2023 slaughtered

	Standard	Diverse	P-value
Ultimate pH	5.69 ± 0.02	5.66 ± 0.02	0.305
Meat lightness (L*)	37.4 ± 0.4	35.7 ± 0.4	0.007
Meat redness (a*)	15.5 ± 0.2	16.6 ± 0.3	0.006
Cooking loss (%)	31.7 ± 0.4	29.8 ± 0.4	0.002
Driploss (%)	3.8 ± 0.5	4.5 ± 0.6	0.422
Shear force (kgF)	2.74 ± 0.20	2.23 ± 0.22	0.100

2023 born, 2024 slaughtered

Prewean treatment	Std-Conv	Std-Reg	Div-Conv	Div-Reg	P-value	P-value
Postweaning pasture	Standard		Diverse		Prewean	Postwean
Ultimate pH	5.69	5.67	5.74	5.67	0.113	0.305
Meat lightness (L*)	35.6	34.8	34.9	34.4	0.177	0.168
Meat redness (a*)	14.5	15.0	15.1	14.6	0.383	0.779
Cooking loss (%)	32.4a	30.8b	32.3a	31.7a	0.014	0.928
Driploss (%)	3.9	3.2	4.2	3.1	0.168	0.877
Shear force (kgF)	3.09	2.65	2.74	2.88	0.071	0.653



Insights & implications of meat quality results

- Although there were some statistically different values, the values are not sufficiently numerically different to be concerned from an eating quality perspective.
- In particular, shear force values were low for all treatments, well below the threshold of 4.08 kgF proposed by Hopkins et al. (2006) for consumer acceptance of lamb. In fact, all treatments were closer to the conservative target of 2.75 kgF for ensuring the eating quality of lamb (Hopkins et al., 2006).
- Overall equal, but excellent, meat quality for lambs and finished on both the standard and diverse pastures after weaning.
- Likewise, conventional and regenerative management prior to weaning did not generate any issues with meat quality.

