



Milk production and body composition of East Friesian x Romney and Border Leicester x Merino ewes

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- There is a move toward incorporating new breeds into the traditional prime lamb breeding program in Australia.
- New Zealand research suggests that introducing EF genetics into commercial milking herds would improve milk yield (Newman and Stieffel, 1999).
- The productivity of East Friesian is largely unknown under Australian conditions.
- Border Leicester x Merino serves as a good comparison with new breeds although there is also little information on their milk production.

- Ewes are generally in a state of negative energy balance during early and into mid lactation (Geenty and Sykes, 1986).
- In order to measure the extent of mobilisation it is necessary to have a technique to measure serial changes in body composition.
- Ultrasound and dilution techniques have been used to measure body composition of small ruminants (Cowan *et al*, 1979; Foot *et al*, 1979; Dunshea *et al*, 1990;1991).

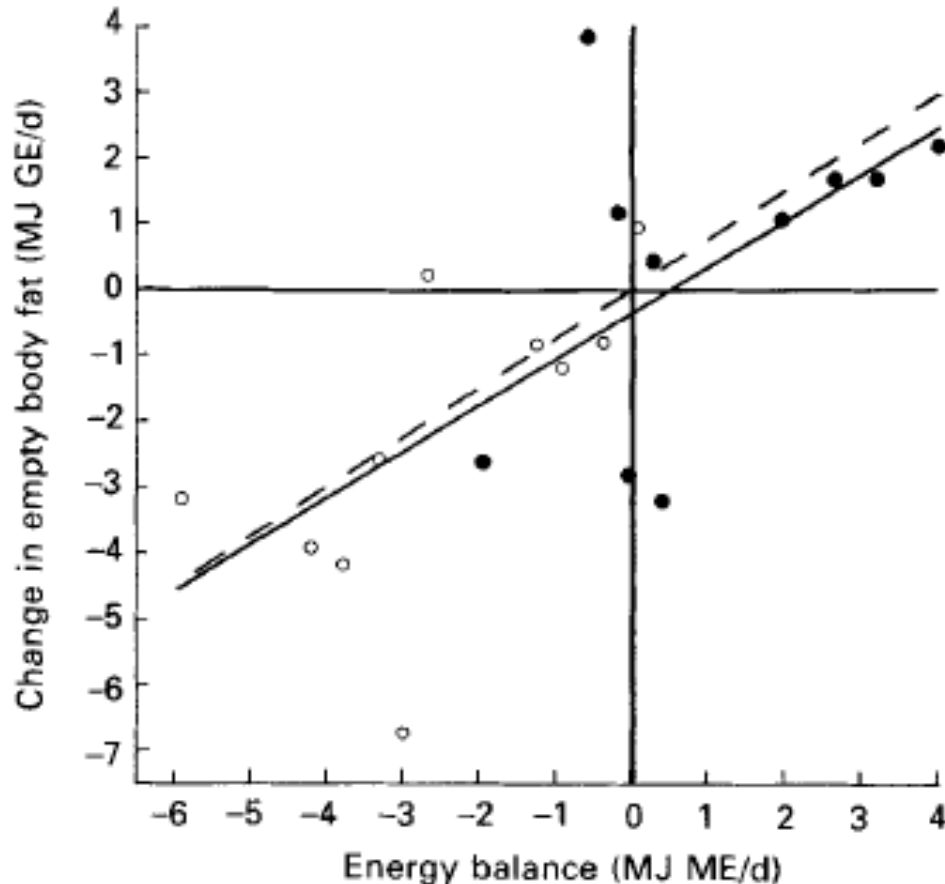


Fig. 2. Change in empty-body fat (MJ gross energy (GE)/d), predicted from estimated body composition v. average calculated energy balance (MJ metabolizable energy (ME)/d) in ten lactating goats between days 10 and 38 (○) and between days 38 and 76 (●) of lactation.

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- Ultrasound and dilution techniques have been used to measure body composition of small ruminants (Cowan *et al*, 1979; Foot *et al*, 1979; Dunshea *et al*, 1990;1991).
- Dual energy X-ray absorptiometry offers a means of serially measuring body composition in sheep



MATERIAL SAFETY DATA SHEETS

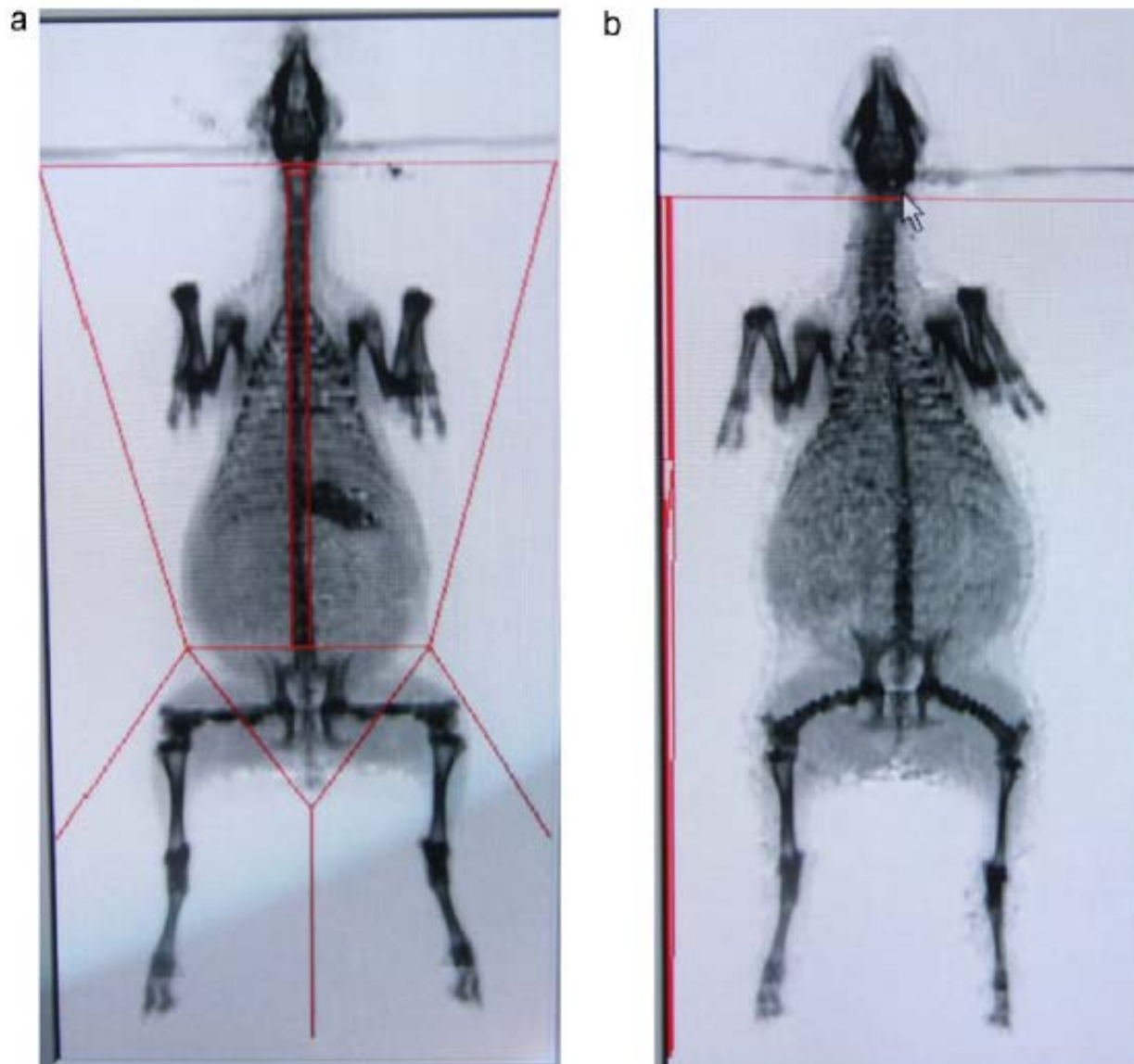
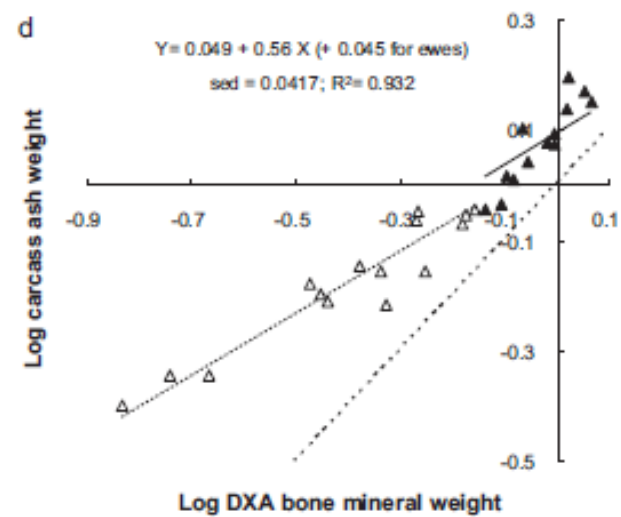
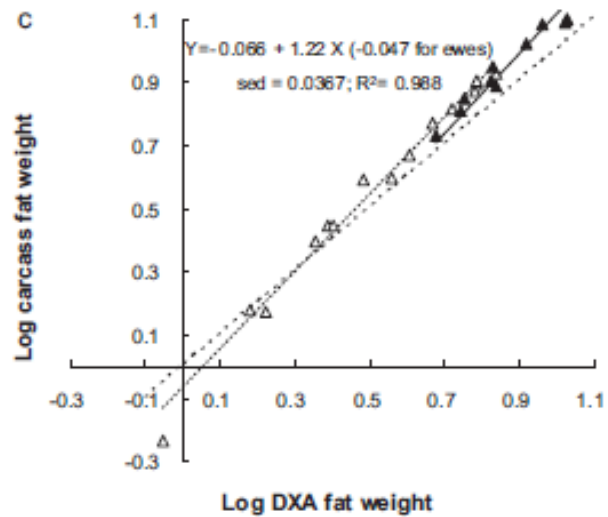
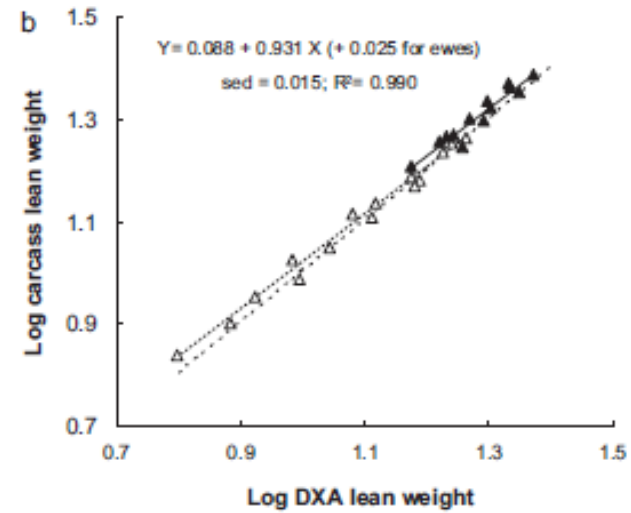
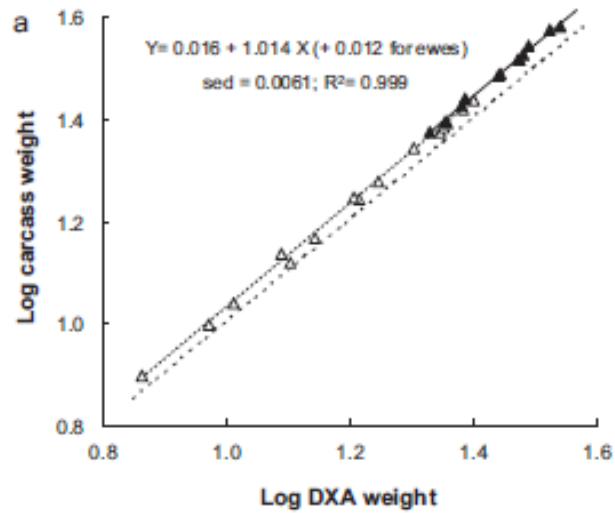


Fig. 1. Dual energy X-ray absorptiometry regional analysis grid and a live animal scan image analysed with: (a) grid placement 1, the scan image was analysed as closely as possible to the human model as specified by the manufacturer except the front legs are placed in the trunk region (modified human mode); (b) grid placement 2, the body in the scan image was placed in the arm region and head in the head region.



Question?

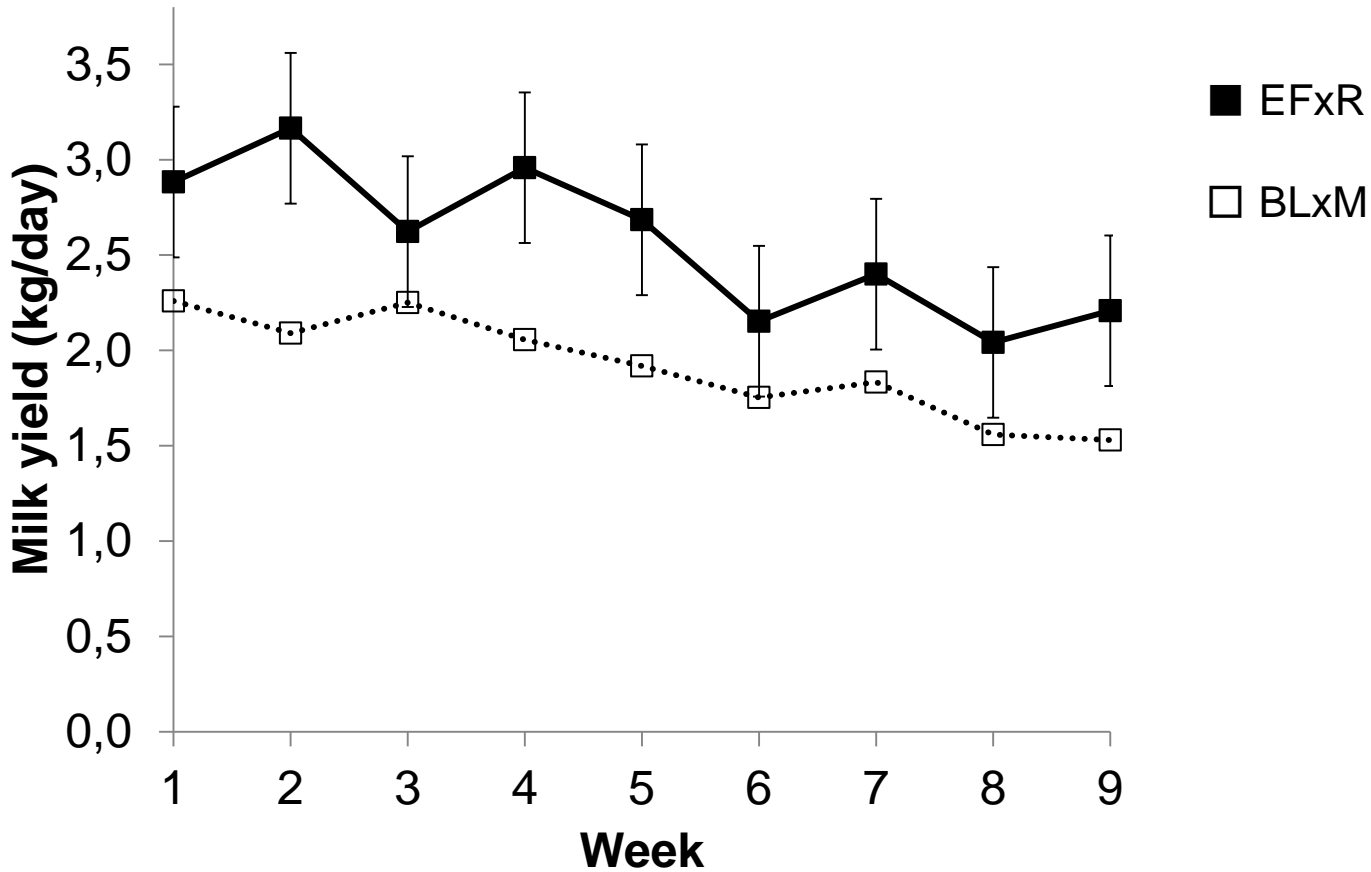
- Do East Friesian sheep offer the potential to be incorporated into the Australian sheep flock as either a meat or milking line?

- That East Friesian x Romney (EFxR) ewes would have greater milk yield than Border Leicester x Merino (BLxM) cross ewes.
- That the progeny of EFxR would obtain more milk and grow faster than progeny from BLxM ewes.
- That DXA can be used to detect differences in the mobilisation of body composition during early lactation in both breeds.

- Eight second parity single-bearing EFxR ewes and eight second parity single-bearing BLxM ewes were selected from a flock that had been mated to EF rams
- After lambing, ewes were offered concentrate pellets ad libitum and 250 g/d of oaten chaff.
- Single lambs were allowed to suckle their dam except when measuring potential milk yield and were introduced to supplemental feed at 3 wk.
- Potential milk yield was determined using the iv oxytocin method 2X/wk for the first 9 wk of lactation.
- Body composition was determined by dual energy X-ray absorptiometry at 1, 3, 5 and 9 wk.

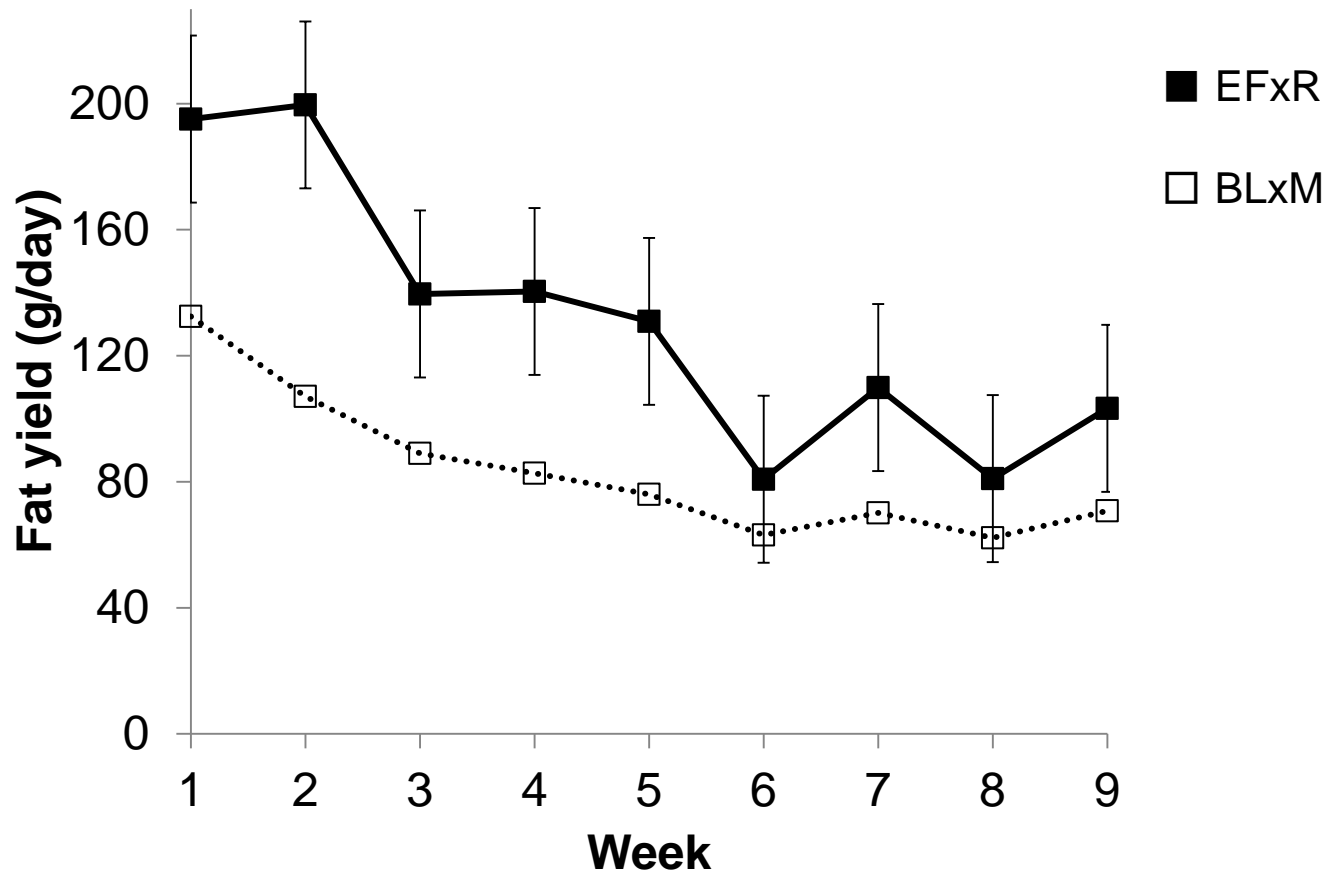


EFR ewes have greater potential milk yield than BLxM ewes



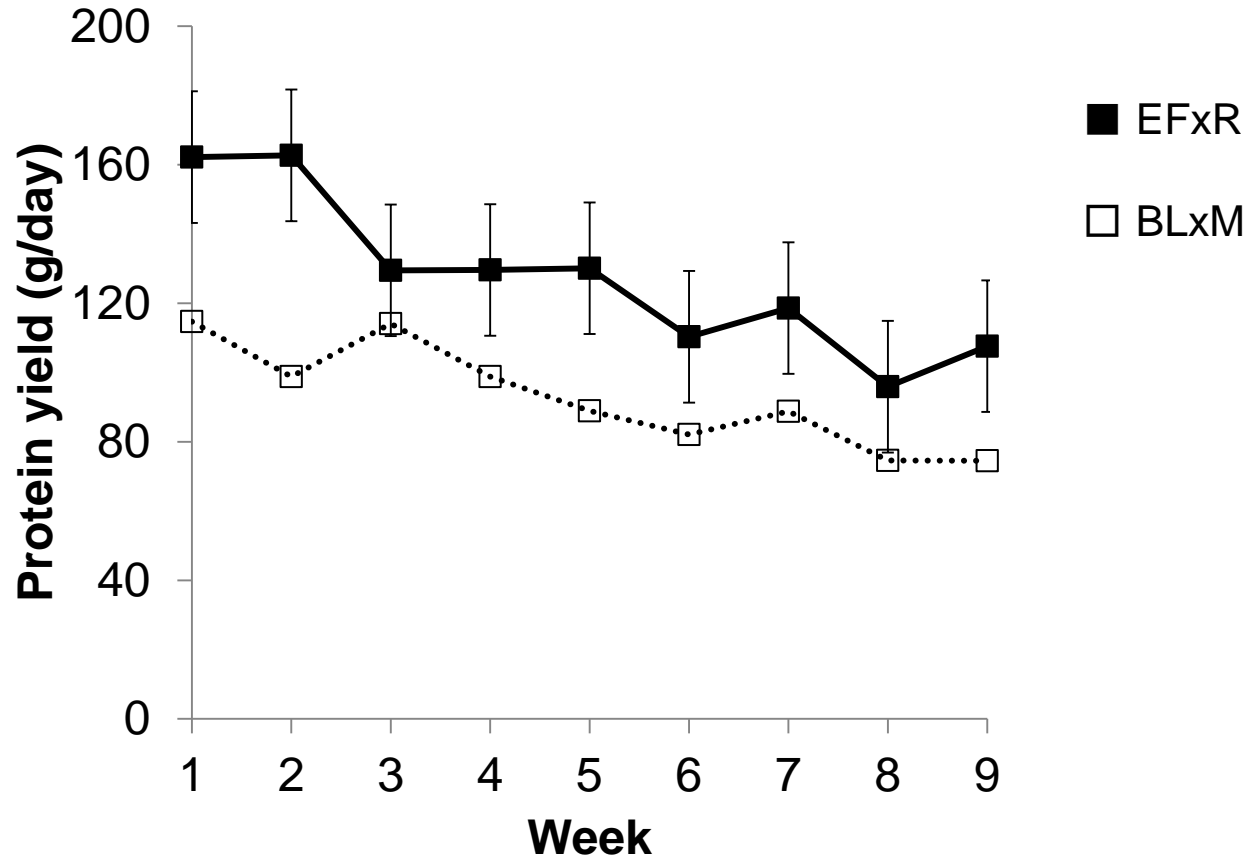


EFR ewes have greater potential milk fat yield than BLxM ewes



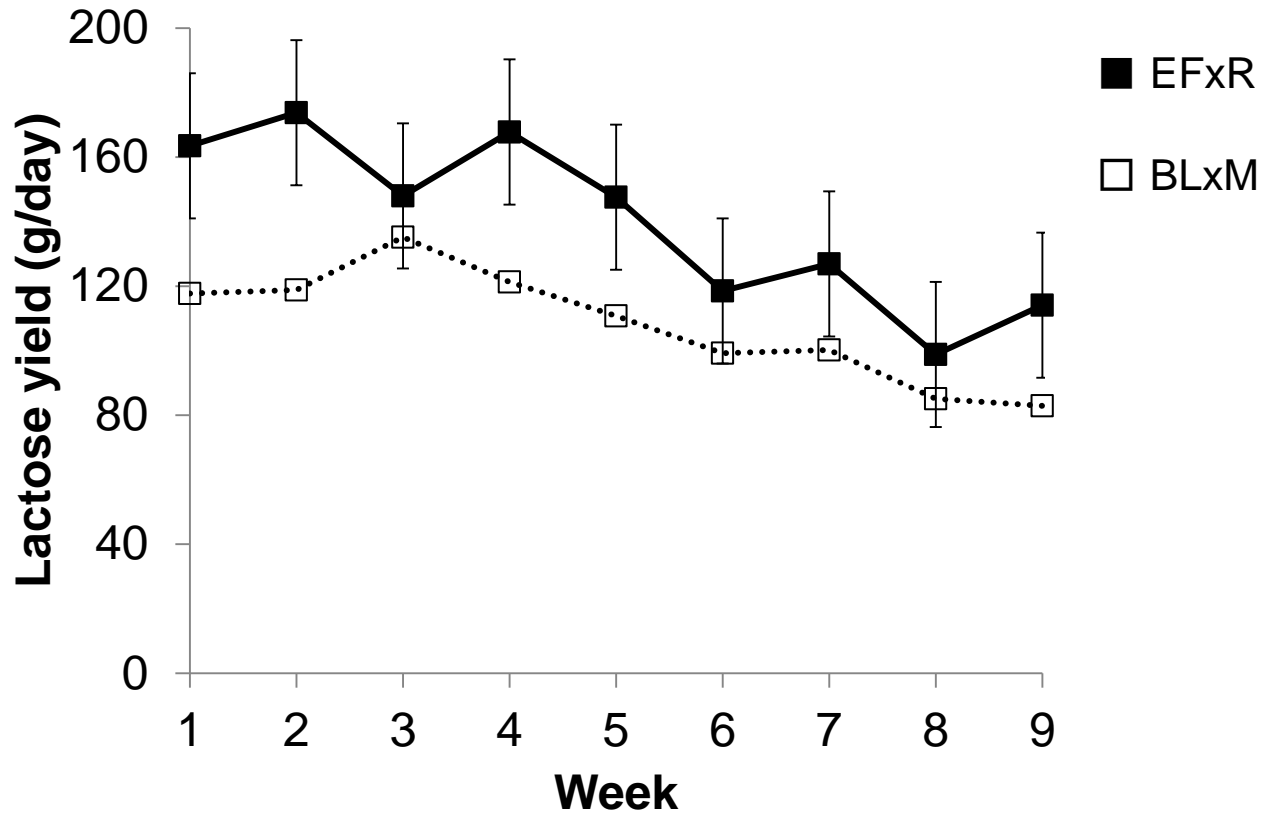


EFR ewes have greater potential milk protein yield than BLxM ewes



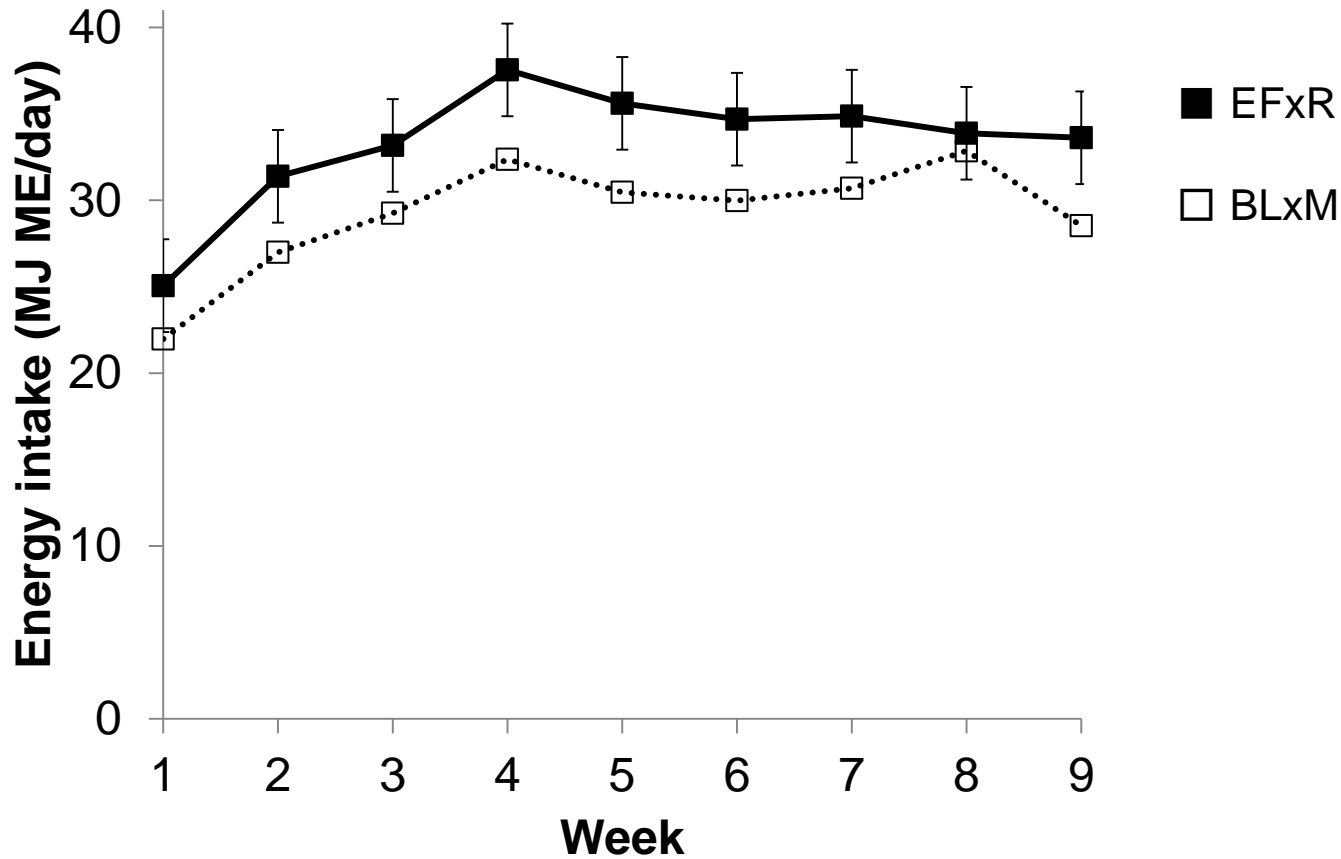


EFR ewes have greater potential milk lactose yield than BLxM ewes



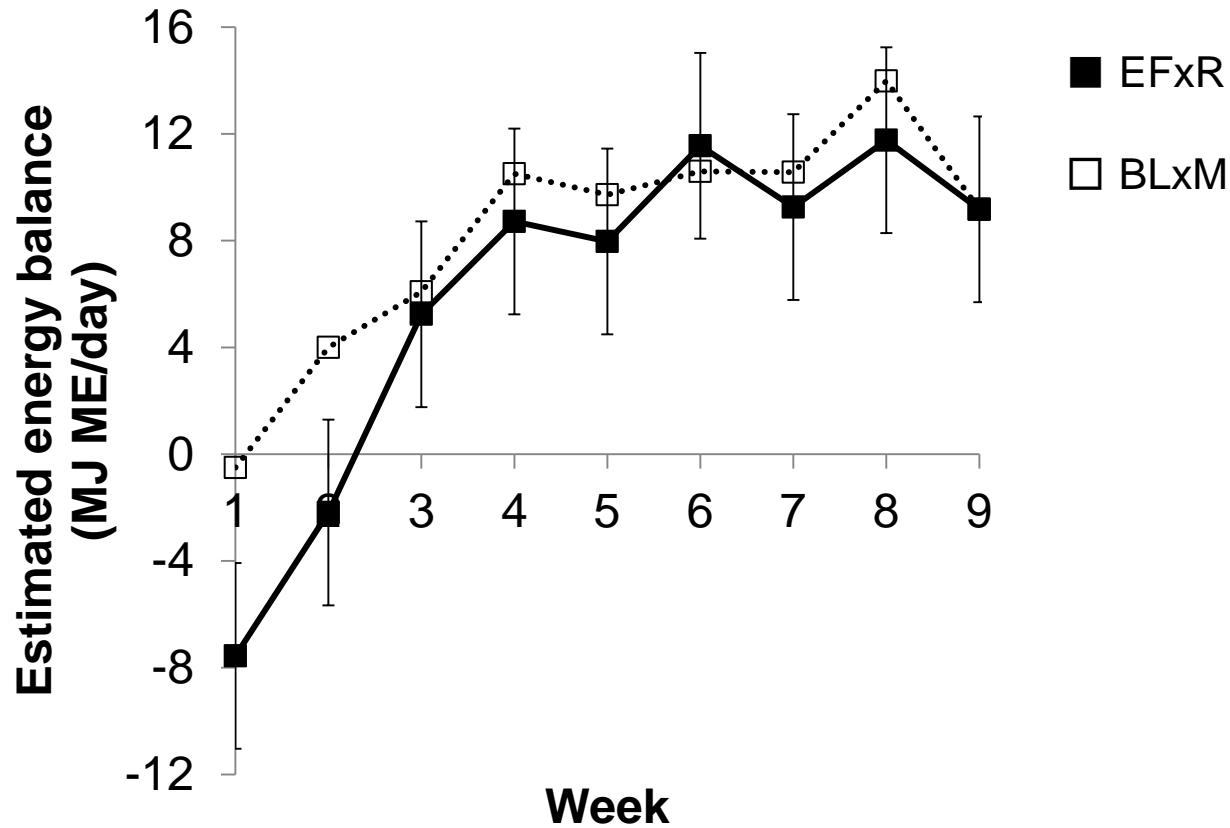


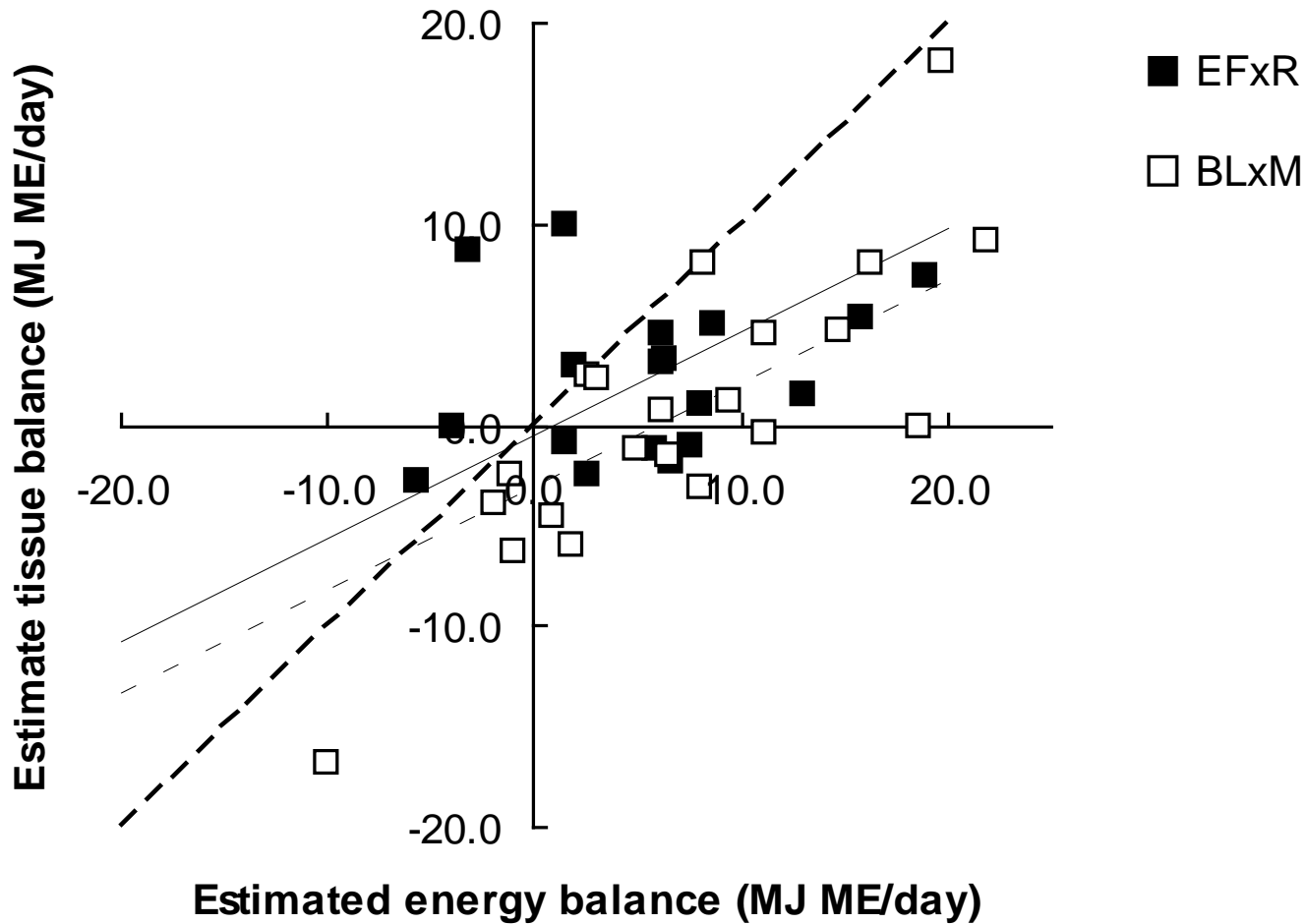
There was no difference in energy intake ($P=0.14$) between EFR and BLM ewes





There was no difference in energy intake ($P=0.14$) between EFR and BLM ewes except in first 2 weeks





- There were no differences in lamb birth weight between the EFxR and BLxM
- There were no differences in lamb dry feed intake and daily gain between the EFxR and BLxM



Conclusion

- EFxR ewes have a higher potential milk yield than BLxM ewes although this may not be expressed in single-bearing ewes with moderate suckling intensity
- Dual energy X-ray absorptiometry (DXA) offers a means of measuring changes in body composition in lactating ewes.

