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The ratio between energy and lysine is essential to improve milk yield in sows

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Background

- Dramatic changes in nutrient requirements during the transition period
- The sow mobilize from body tissues to support milk production
- Excessive mobilization compromise the reproductive performance and longevity of the sow
- In Denmark, sows are fed one diet, from 1 week before to 4 weeks after parturition, composed to match nutrient requirement in peak lactation

Aim of project

- Develop a two-diet feeding system for precision feeding of lactating sows
  - Basal diet, matching sow maintenance requirements
  - Lactation supplement, matching requirements for milk synthesis
- To study how insufficient supply of energy or lysine or both, affects milk production and mobilization of body fat and protein

Study design

- 24 second parity Danish Landrace x Yorkshire sows, randomly assigned to 1 of 4 groups
  - Balanced for BW at d 101 of gestation
- Sow were fed basal diet according to BW and supplement according to milk production
  - Predicted from piglet weight gain measured on d 2, 4, 7, 14, 21, and 28, according to Hansen et al. 2014
- Litter size were standardized to 14 piglets. Piglets had no access to creep feed. Sows and piglets had ad lib water
- Body composition derived on d 2 and 28 from BW and backfat thickness (Rozeboom et al. 1994)

Diets

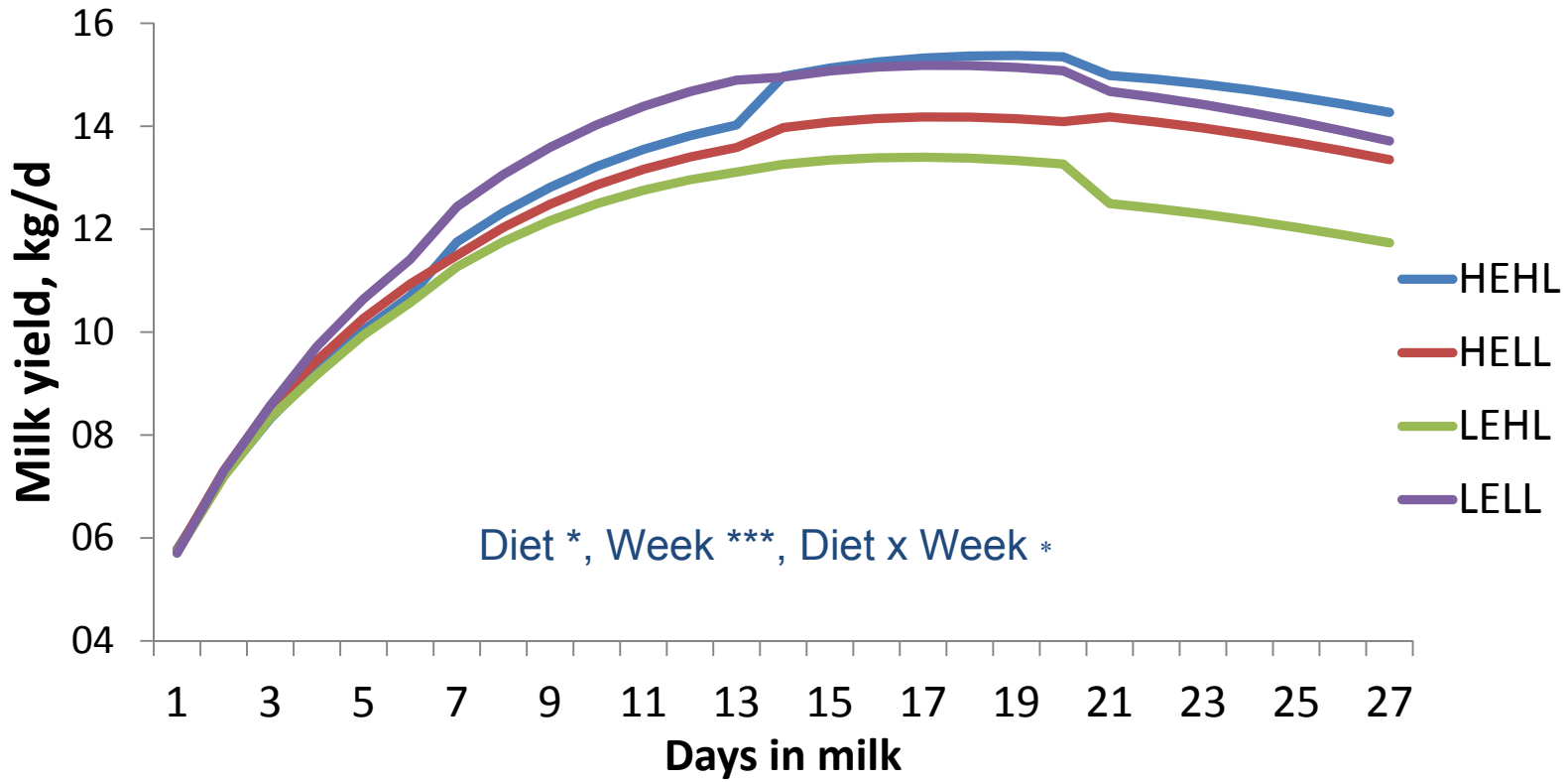
- Two diets composed:

	MJ ME/kg DM	g SID Lys/kg DM	Supports
Basal diet	16.5	4.3	Sow maintenance
Lactation suppl.	16.9	7.8	Milk production

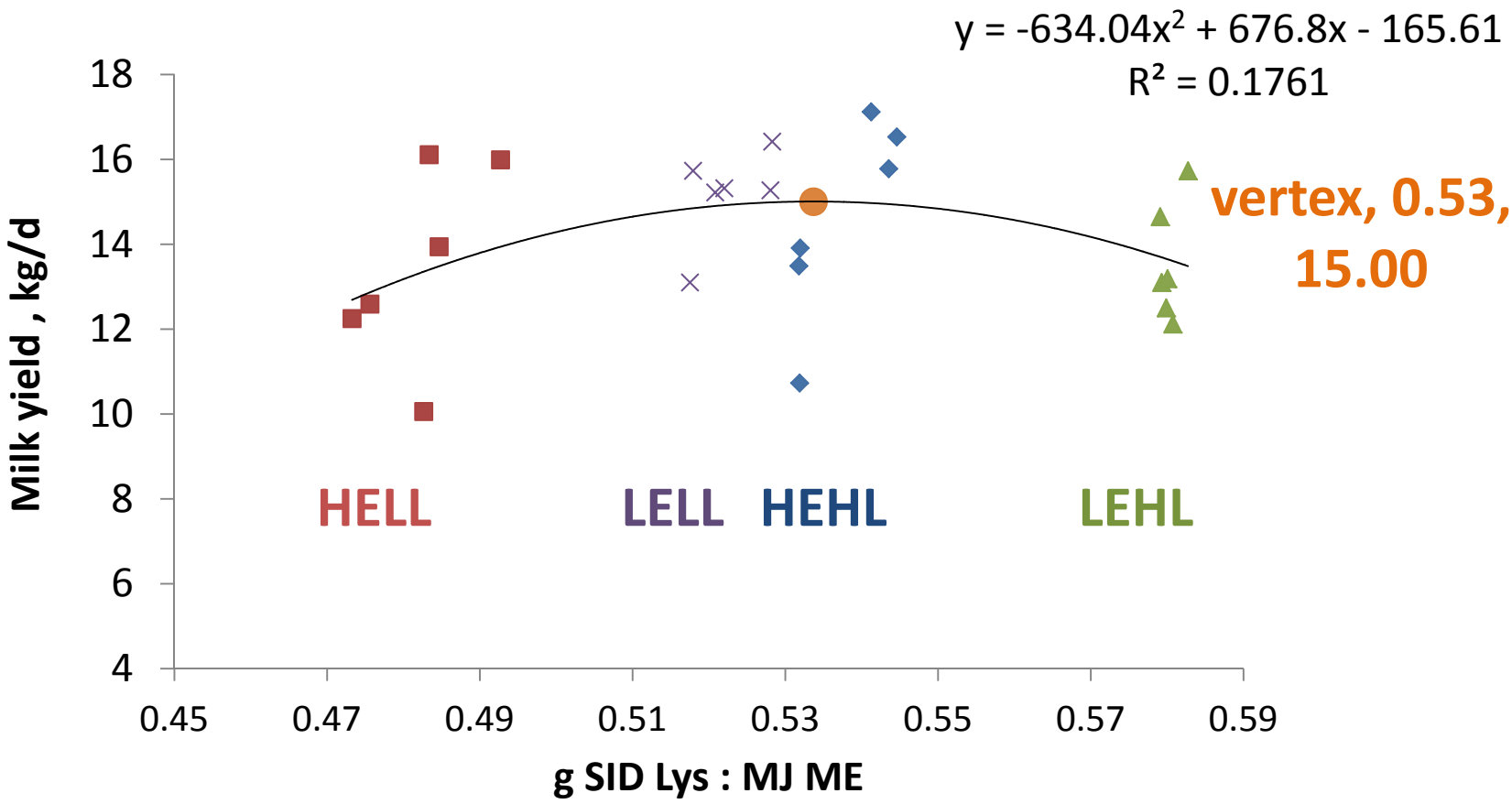
- 4 dietary groups:

	Relative to requirement			Expected mobilization
	Energy	Protein	Lysine	
LELL	70%	74%	71%	Fat and protein
LEHL	70%	81%	87%	Mainly fat
HELL	100%	93%	84%	Mainly protein
HEHL	100%	100%	100%	None

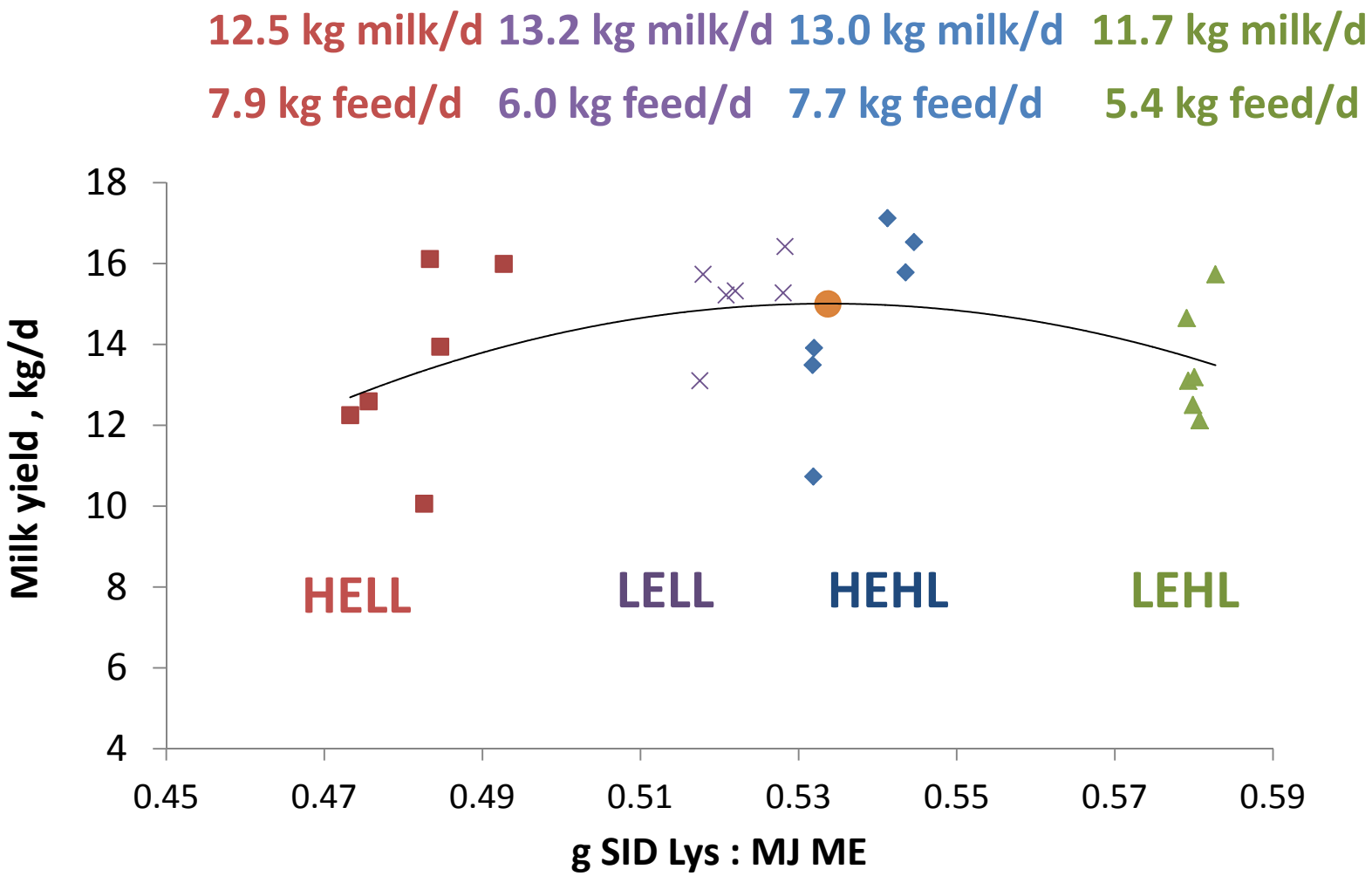
Results - Milk yield



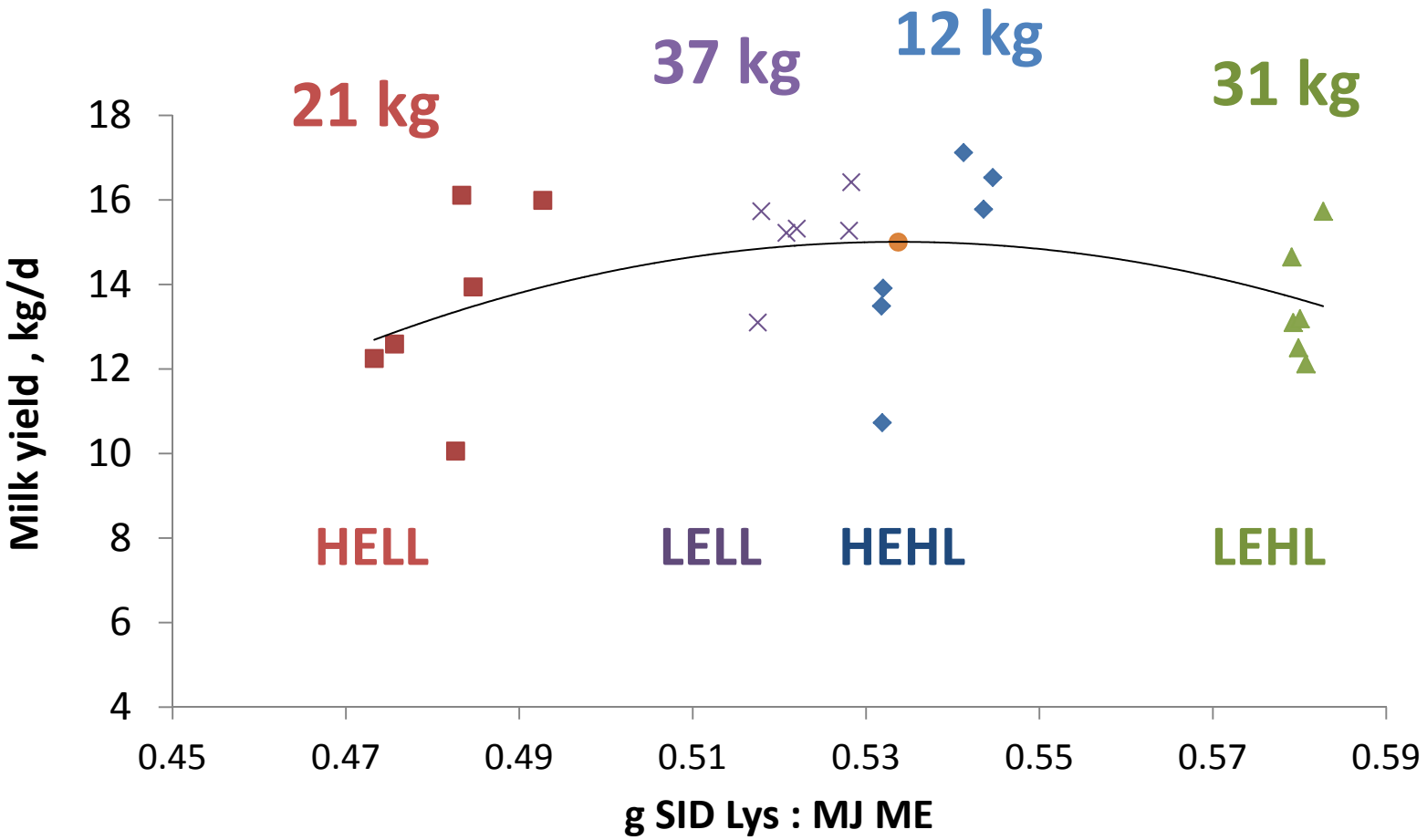
Milk yield in relation to the lysine to energy ratio in the feed



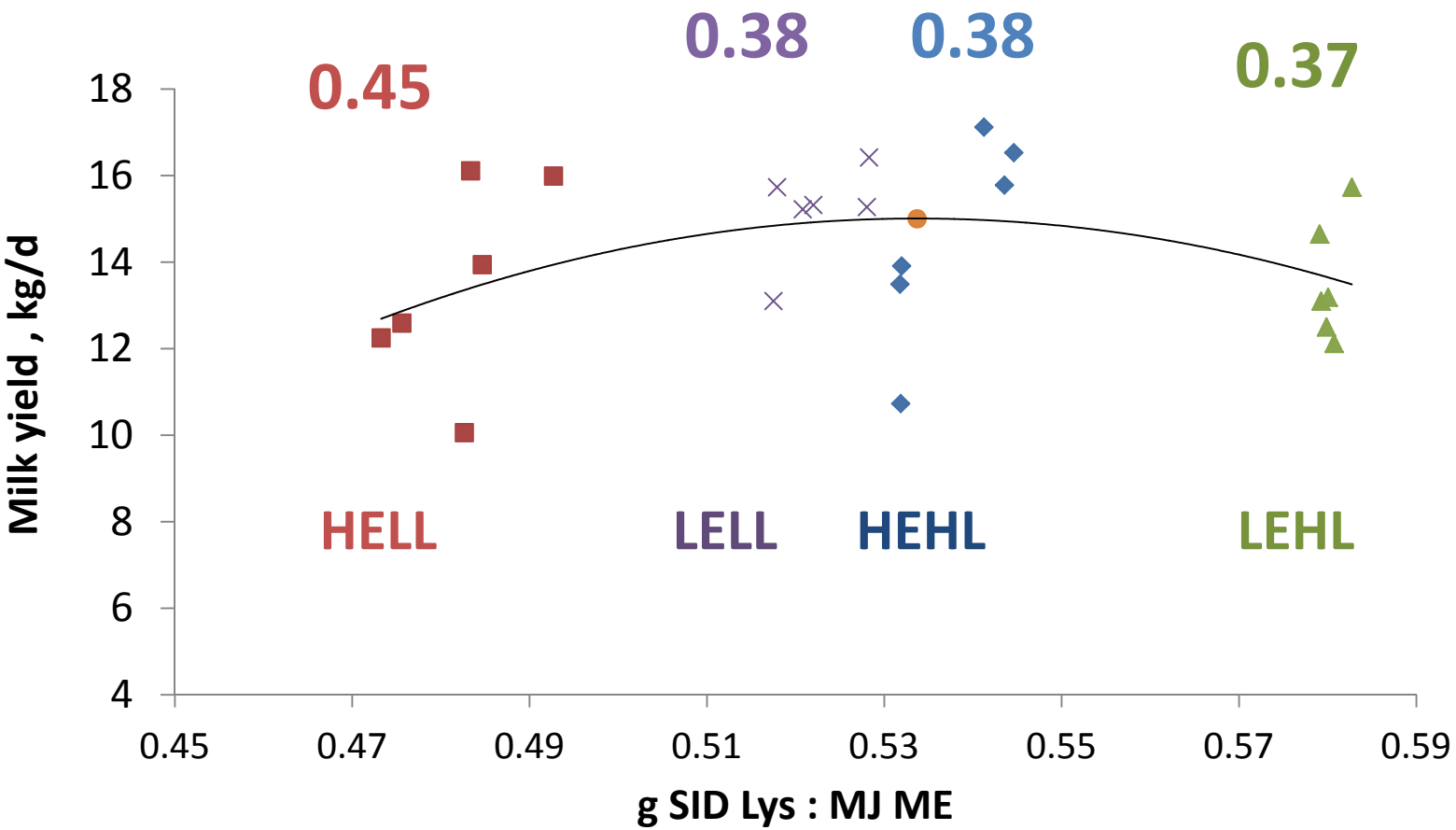
Milk yield and feed intake



Milk yield in relation to weight loss



The ratio between mobilized protein and fat



Conclusions

- Individual feeding based on BW and individual milk production is effective in increasing milk yield, minimizing weight loss and reducing feed costs
- An optimal ratio between lysine and energy in the feed increases milk production, but the level of energy and protein has minor impact on milk yield, but affects weight loss
- In spite of large differences in the ratio between lysine and energy in the feed, only minor changes in the ratio between mobilized protein and energy was observed

Thank you!