

Eating behavior and milk production of high efficient vs low efficient high yielding lactating cows

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Conclusion

- Milk yield and body weight are not indicators for feed efficiency.
- Eating rate and meal size are the indicators for cow individual feed efficiency.

Materials and methods

155 Israeli-Holstein high yielding (milk yield > 35 kg/d) cows fed low roughage TMR (31.6% of dry matter) sorted into 3 groups: 20% high efficient (RFI < 0, ECM/DMI > 1.55), 20% low efficient (RFI > 2.75, ECM/DMI < 1.40), and 60% mid efficiency. Data in table below show averages of efficiency groups.

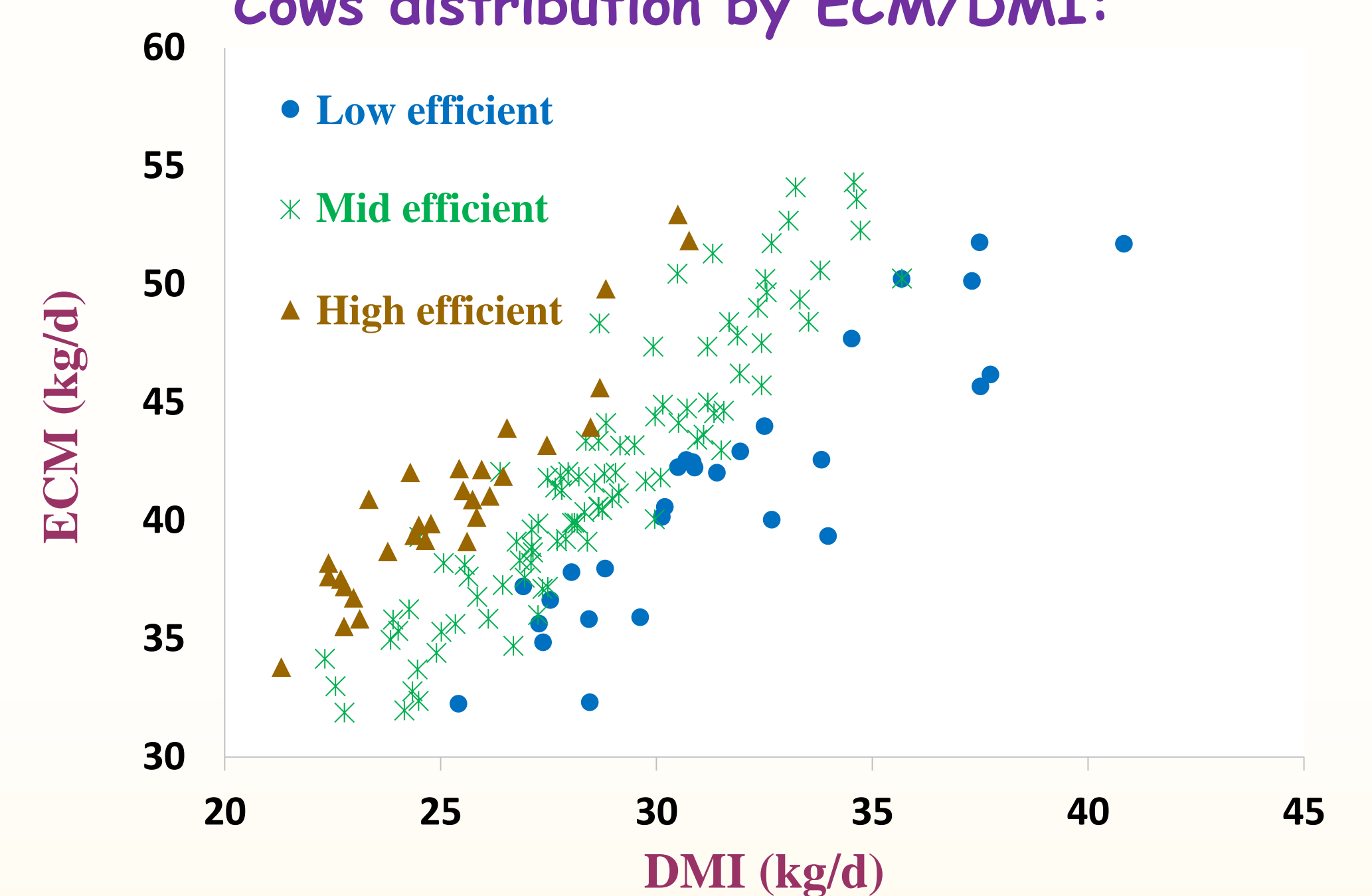
Parameter	Efficiency group (means ± SE)			P		
	High efficient	Mid efficient	Low efficient	HE×LE	HE×ME	LE×ME
N	31	93	31			
RFI, kg DM/d	-0.84 ± 0.25	2.02 ± 0.13	5.25 ± 0.33	0.01	0.01	0.01
ECM/DMI	1.64 ± 0.01	1.47 ± 0.01	1.31 ± 0.01	0.01	0.01	0.01
DIM	128 ± 8.72	126 ± 3.98	122 ± 5.58	0.98	0.84	0.74

DM – dry matter; DMI – dry matter intake; DIM – days in milking; ECM – energy corrected milk; RFI – residual feed intake



Individual dairy barn, ARO

Cows distribution by ECM/DMI:

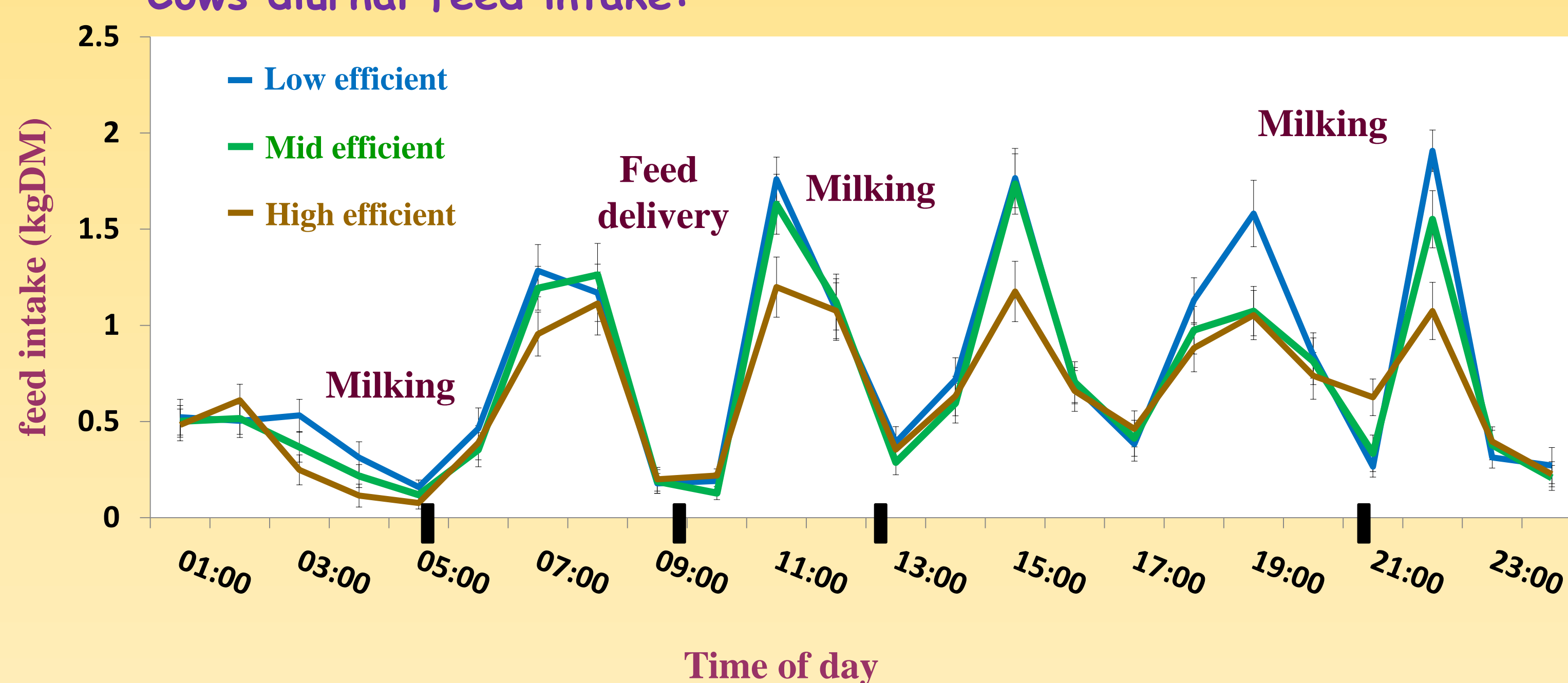


Results

Parameter	Efficiency group (means ± SE)			P		
	High efficient	Mid efficient	Low efficient	HE×LE	HE×ME	LE×ME
DMI, kg/d	25.3 ± 0.44	28.6 ± 0.32	31.5 ± 0.73	0.01	0.01	0.01
ECM, kg/d	41.3 ± 0.14	41.7 ± 0.09	41.3 ± 0.18	0.90	0.08	0.10
BW gain, g/d	161 ± 73	302 ± 49	315 ± 105	0.44	0.35	0.99
Eating rate, kgDM/min.	117.5 ± 1.1	137.5 ± 0.6	144.8 ± 1.2	0.01	0.01	0.01
Meal size, kg DM	3.76 ± 0.17	4.37 ± 0.09	4.63 ± 0.17	0.01	0.01	0.01
Eating time, min./d	215.3 ± 6.0	208.0 ± 3.0	217.5 ± 3.9	0.32	0.01	0.01

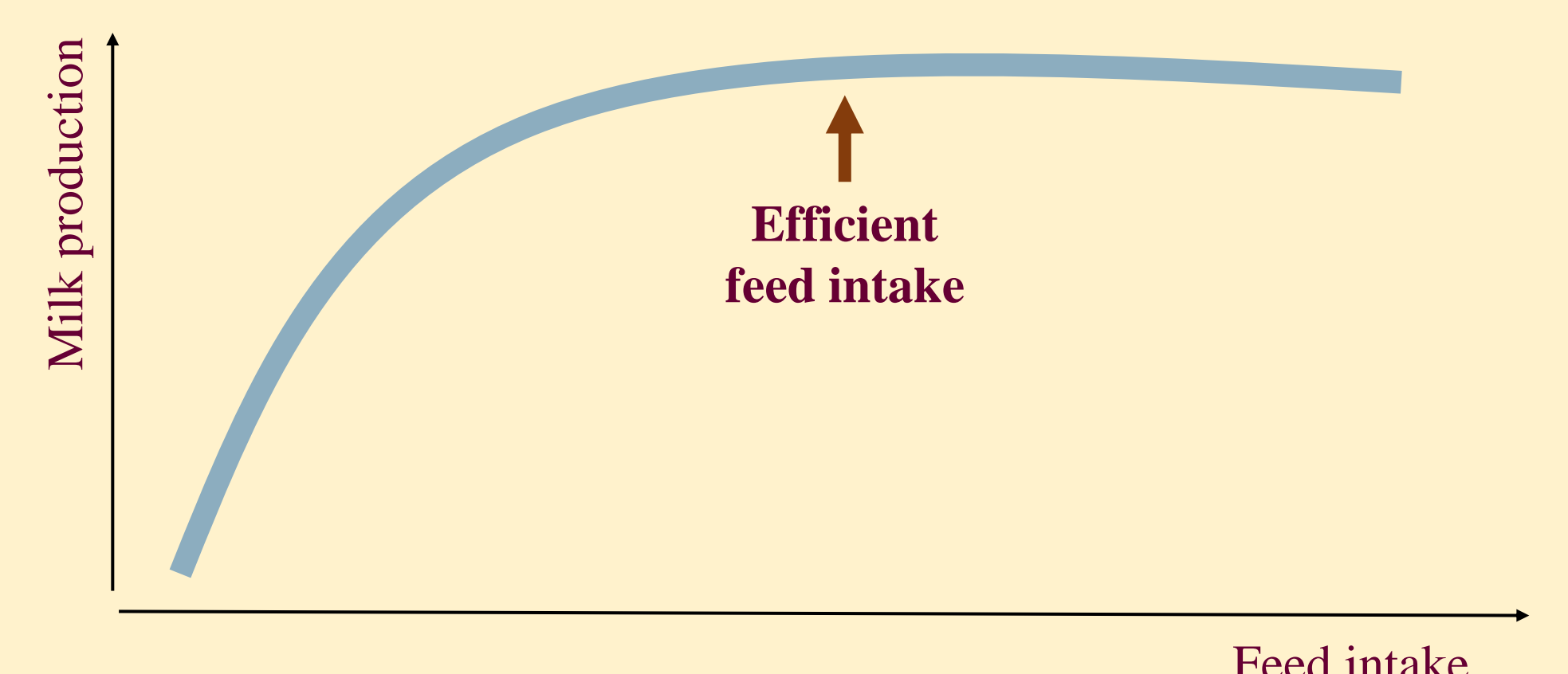
BW – body weight

Cows diurnal feed intake:



Discussion

The higher DMI of the LE cows in this study originated from higher rate of eating and larger meal size. Analysis of DM consumed by each cow during each hour along day and night showed that in the three efficiency groups meals were motivated by external events including feeding or returning from each milking and average meal lasted between 35 to 36 minutes. It is therefore suggested, that in this study, LE cows that eat faster than HE cows consume 23% more low-roughage feed before the physiological responses to absorbed fuels (Hepatic oxidation Theory) activates the satiety feeling.



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