Net Energy for Growing & Finishing Beef Cattle

Net energy for maintenance (NE_m) and gain (NE_g) are used to formulate diets for growing and finishing cattle. These energy values are more useful than TDN, because they allow more accurate prediction of the amount of energy used for maintenance and gain purposes. NE_m of a feed measures the ability of the feed to meet the energy requirement for maintenance. NE_g of a feed measures the ability of the feed to meet the energy requirements for gain. Remember, that energy needs for maintenance must be met first before the animal can use any energy for growth (gain). Once energy needs for maintenance are met, then the remaining energy in the diet can go towards gain. Net energy values of feeds, along with feed intake, can also be used to predict the gain that animals will make on particular diets. The reason that feeds have two different NE composition values, one for maintenance and one for gain, is that feed energy is used more efficiently for maintenance than for gain. Therefore, NE_m values are always higher for a feed than NE_g values.

A cattle feeder is feeding the following diet to a group of 715 lb growing yearling steers (1,300 lb at finishing; Use Table 9 for requirements).

Ingredient	% of diet	NE_m, Mcal/kg	NE_m supplied, Mcal/kg	NE_g, Mcal/kg	NE_g supplied, Mcal/kg
Corn silage	20	1.63	***0.20 x 1.63 = 0.326***	1.03	***0.20 x 1.03 = 0.206***
Corn	73	2.24	***0.73 x 2.24 = 1.6352***	1.55	***0.73 x 1.55 = 1.1315***
SBM	5	2.06	***0.05 x 2.06 = 0.103***	1.40	***0.05 x 1.40 = 0.07***
Alfalfa meal	2	1.34	***0.02 x 1.34 = 0.0268***	0.77	***0.02 x 0.77 = 0.0154***
Total	100	----------	***2.091***	----------	***1.42***

The diet fed above supplies: ***2.091*** Mcal/kg of NE_m, and
1.42 Mcal/kg of NE_g

If the 715 lb yearling steers (1,300 lb at finishing) are consuming 16 lb of the above diet each day, what is their expected average daily gain?

NE_m required per day (Table 9) = ***5.89*** Mcal/day

Amount of diet required for maintenance = ***6.21*** lb
amt diet req for main = (NE_m required)/(NE_m per kg of diet)
amt diet req for main = ***5.89 Mcal*** / ***2.091 Mcal/kg*** = ***2.82*** kg

Convert from kg to lb
2.82 kg / 0.454 lb/kg = 6.21 lb required for maintenance

Amount of diet left for gain = ***4.44*** kg
amt diet left for gain = (Intake) - (feed req for main.)
amt diet left for gain = ***16 lb*** - ***6.21 lb*** = ***9.79*** lb

Convert from lb to kg
9.79 lb x 0.454 = 4.44 kg

Amount of NE_g available for gain = ***6.30*** Mcal
amt NE_g available = (NE_g/kg of diet) X (kg diet remaining)
amt NE_g available = ***1.42 Mcal/kg*** X ***4.44 kg*** = ***6.30*** Mcal

From Table 9, find the NE_g for 715 lb yearling steers (1,300 lb at finishing) that most closely approaches the amount of NE_g available for gain. Estimate the average daily gain for these animals.

Need 6.94 Mcal to gain 3.99 lb/day, so extrapolate
3.99 lb / 6.94 Mcal = x lb / 6.30 Mcal
x = 3.62 lb/day