

# Yem enerji hesaplaması (eşitlikleri)

## ADF-NDF enerji eşitlikleri-1

Table 1. Prediction Equations from Midwest

Legume and Grass Forages  $Y = mX + B$

$$\%DDM = 88.9 - (0.779 \times ADF)^a$$

Corn Silage  $Y = mX + B$

$$\%TDN = 87.84 - (.70 \times ADF)^b$$

Shelled Corn

$$\%TDN = 92.22 - (1.535 \times ADF)^c$$

$$NE_L \text{ (Mcal/lb)} = 0.905 - (0.0026 \times ADF)^c$$

Ear Corn

$$\%TDN = 99.72 - (1.927 \times ADF)^c$$

$$NE_L \text{ (Mcal/lb)} = 1.036 - (0.0203 \times ADF)^c$$

TDN conversion to NE<sub>L</sub>

$$NE_L \text{ (Mcal/lb)} = (TDN \times .01114) - 0.054^d$$

<sup>a</sup> Source: Rohweder, Barnes and Jorgensen, J. Anim. Sci. 68:403

<sup>b</sup> Source: Schmidt *et al.*, Agron. J. 68:403

<sup>c</sup> Source: Pennsylvania State

<sup>d</sup> Source: NRC, Dairy Update, 1989

Table 2. Prediction equations from Pennsylvania State<sup>a</sup>

Legumes

$$\%TDN = 4.898 + (89.796 \times NE_L)$$

$$ENE \text{ (Mcal/100 lb)} = NE_L \times 82.6$$

$$NE_L \text{ (Mcal/lb)} = 1.044 - (0.0119 \times ADF)$$

Mixed Forages

$$\%TDN = 4.898 + (89.796 \times NE_L)$$

$$ENE \text{ (Mcal/100 lb)} = NE_L \times 82.6$$

$$NE_L \text{ (Mcal/lb)} = 1.0876 - (0.0127 \times ADF)$$

Grasses

$$\%TDN = 4.898 + (89.796 \times NE_L)$$

$$ENE \text{ (Mcal/100 lb)} = NE_L \times 82.6$$

$$NE_L \text{ (Mcal/lb)} = 1.0876 - (0.0127 \times ADF)$$

Corn Silage

$$\%TDN = 31.4 + (53.1 \times NE_L)$$

$$ENE \text{ (Mcal/100 lb)} = NE_L \times 82.6$$

$$NE_L \text{ (Mcal/lb)} = 1.044 - (0.0124 \times ADF)$$

Sorghum, Small Grain Forages

$$\%TDN = 4.898 + (89.796 \times NE_L)$$

$$ENE \text{ (Mcal/100 lb)} = NE_L \times 82.6$$

$$NE_L \text{ (Mcal/lb)} = 0.7936 - (0.00344 \times ADF)$$

Complete Rations

$$\%TDN = 93.53 - (1.03 \times ADF)$$

$$ENE \text{ (Mcal/100 lb)} = 82.04 - (0.76 \times ADF)$$

$$NE_L \text{ (Mcal/lb)} = (TDN \times 0.0234) - 0.5448$$

Grain Mixtures (CF = crude fiber)

$$\%CF = ADF \times .80$$

$$\%TDN = 81.41 - (0.60 \times CF)$$

$$ENE \text{ (Mcal/100 lb)} = 90.02 - (1.0532 \times CF)$$

$$NE_L \text{ (Mcal/lb)} = (TDN \times 0.0234) - 0.5448$$

Ear Corn

$$\%TDN = 99.72 - (1.927 \times ADF)$$

$$ENE \text{ (Mcal/100 lb)} = TDN \times 1.025$$

$$NE_L \text{ (Mcal/lb)} = 1.036 - (0.0203 \times ADF)$$

Shelled Corn

$$\%TDN = 92.22 - (1.535 \times ADF)$$

$$ENE \text{ (Mcal/100 lb)} = TDN \times 1.053$$

$$NE_L \text{ (Mcal/lb)} = 0.950 - (0.0026 \times ADF)$$

Small Grains

$$\%TDN = 4.898 + (89.796 \times NE_L)$$

$$ENE \text{ (Mcal/100 lb)} = 96.0548 - (0.8929 \times ADF)$$

$$NE_L \text{ (Mcal/lb)} = 0.9265 - (0.00793 \times ADF)$$

## ADF-NDF enerji eşitlikleri-2

Table 3. Equations from Western Region\*

Alfalfa

$$\%TDN = 82.38 - (0.7515 \times ADF)$$

$$NE_L \text{ (Mcal/lb)} = 0.8611 - (0.00835 \times ADF)$$

\*Bath, Donald L. and Vern L. Marble. 1989. Testing Alfalfa for Its Feeding Value. Univ of CA. Cooperative Extension. Leaflet 21457. (WREP 109).

Table 4. Prediction Equations from New York State

Grasses

$$\%TDN = 34.9 + (53.1 \times NE_L)$$

$$ENE \text{ (Mcal/lb)} = NE_L \times 0.826$$

$$NE_L \text{ (Mcal/lb)} = 1.085 - (0.0150 \times ADF)$$

Legumes

$$\%TDN = 29.8 + (53.1 \times NE_L)$$

$$ENE \text{ (Mcal/lb)} = NE_L \times 0.826$$

$$NE_L \text{ (Mcal/lb)} = 1.044 - (0.0123 \times ADF)$$

Mixed Forages

$$\%TDN = 32.4 + (53.1 \times NE_L)$$

$$ENE \text{ (Mcal/lb)} = NE_L \times 0.826$$

$$NE_L \text{ (Mcal/lb)} = 1.044 - (0.0131 \times ADF)$$

Complete Feed

$$\%TDN = 95.88 - 0.911 \times ADF$$

$$ENE \text{ (Mcal/lb)} = 1.0123 - (0.01432 \times ADF)$$

$$NE_L \text{ (Mcal/lb)} = 0.866 - (0.007 \times ADF)$$

Table 5. Prediction equations from D.R. Mertens (personal communication)

Legumes

$$\%TDN_m = 86.2 - (0.513 \times NDF)$$

$$NE_L \text{ (Mcal/lb)} = 1.054 - (0.0098 \times NDF)$$

$$\%TDN_m = 84.2 - (0.598 \times ADF)$$

$$NE_L \text{ (Mcal/lb)} = 1.011 - (0.0113 \times ADF)$$

Grasses

$$\%TDN_m = 105.2 - (0.667 \times NDF)$$

$$NE_L \text{ (Mcal/lb)} = 1.297 - (0.119 \times NDF)$$

$$\%TDN_m = 97.6 - (0.974 \times ADF)$$

$$NE_L \text{ (Mcal/lb)} = 1.120 - (0.0159 \times ADF)$$

Grain mix

$$\%TDN = 81.41 - (0.48 \times ADF)$$

$$ENE \text{ (Mcal/lb)} = 0.9002 - (0.0084 \times ADF)$$

$$NE_L \text{ (Mcal/lb)} = [(TDN \times 0.0245) - 0.12] \times 0.454$$

Ear Corn

$$\%TDN = 99.72 - (1.927 \times ADF)$$

$$ENE \text{ (Mcal/lb)} = TDN \times 1.025$$

$$NE_L \text{ (Mcal/lb)} = 0.94 - (0.008 \times ADF)$$

Shell Corn

$$\%TDN = 92.22 - (1.535 \times ADF)$$

$$ENE \text{ (Mcal/lb)} = TDN \times 0.01053$$

$$NE_L \text{ (Mcal/lb)} = 0.94 - (0.008 \times ADF)$$

Corn Silage

$$\%TDN = 31.4 + (53.1 \times NE_L)$$

$$ENE \text{ (Mcal/lb)} = NE_L \times 0.826$$

$$NE_L \text{ (Mcal/lb)} = 0.94 - (0.008 \times ADF)$$

### ADF-NDF enerji eşitlikleri-3

Table 6. Comparison of TDN prediction equation for alfalfa and legumes.

ADF (%)	NRC Alfalfa %TDN	Table 3	Table 1	Table 2	Table 4	Table 5	Mertens Legume %TDN <sub>xx</sub>
		Western Alfalfa %TDN	Midwest Gr.&Leg %TDN	Penn St Legume %TDN	NY Legume %TDN	Mertens Legume %TDN <sub>m</sub>	
27	68	62.1	67.9	69.8	67.6	68.1	62.6
29	63	60.6	66.3	67.7	66.3	66.9	61.5
31	60	59.1	64.8	65.5	65.0	65.7	60.4
33		57.6	63.2	63.4	63.7	64.5	59.3
35	58	56.1	61.6	61.2	62.4	63.3	58.2
37	55	54.6	60.1	59.1	61.1	62.1	57.1
39		53.1	58.5	57.0	59.8	60.9	56.0
41		51.6	57.0	54.8	58.5	59.7	54.9
43		50.1	55.4	52.7	57.2	58.5	53.8

Table 7. Comparison of TDN prediction equations for grasses.

ADF	NRC Grass %TDN*	Table 1	Table 2	Table 4	Table 5	Mertens Grass %TDN <sub>xx</sub>
		Midwest Gr.&Leg %TDN	Penn St Grass %TDN	NY Grass %TDN	Mertens Grass %TDN <sub>m</sub>	
27		67.9	71.8	71.0	71.3	65.6
29	74	66.3	69.5	69.4	69.4	63.8
31	71	64.8	67.2	67.8	67.4	62.0
33	69	63.2	64.9	66.2	65.5	60.2
35	67	61.6	62.6	64.6	63.5	58.4
37	64	60.1	60.4	63.0	61.6	56.6
39	62	58.5	58.1	61.5	59.6	54.8
41	60	57.0	55.8	59.9	57.7	53.1
43	57	55.4	53.5	58.3	55.7	51.3

\* NRC Grass is an average of bromegrass, orchardgrass and ryegrass.  
NRC timothy was 7 to 8 %-units lower in TDN at each level of ADF.

**Çok daha fazlası (formüller) mevcut !**