

**DEER INPUT: DRY-MATTER INTAKE, METABOLIC, & PROTEIN
REQUIREMENTS (for adult female)**

Season and nutritional status	Metabolizable energy requirement (kcal/day)	Dry-matter intake (g/day)	Digestible dry matter (DDM) (%)	Digestible protein (DP) (%)
Summer:				
Maintenance, no fawns	2,350	1,220	50	4.8
With single fawn	3,100	1,340	60	8.0
With twin fawns	3,500	1,470	62	10.0
Winter:				
From high-quality summer range	960	525	48	1.8
From low-quality summer range	1,050	525	52	1.8

Sources:

Metabolizable energy requirement (ME) and dry-matter intake (DMI): Parker et al. 1999 (Fig. 12 for ME and Fig. 8 for DMI, assuming a summer body weight of 42 kg and winter body weight of 35 kg (Parker et al. 1999) and that voluntary DMI increases with increasing ME (within reasonable limits).

Minimum concentration of **digestible dry matter (DDM)** of diet, given the specified values of ME and DMI and an assumed gross energy content of 4.5 kcal/g and metabolizable energy coefficient of 0.85 (Robbins 1993):

$$DDM = (ME \div 0.85 \div 4.5 \div DMI) \times 100$$

Minimum concentration of **digestible protein (DP)** of diet, given the specified value of DMI and assumed body weights (as above) is calculated as follows:

Dietary Crude Protein Content (%) for maintenance = $([(EUN + MFN (DMI) \times 6.25] \div DMI \div 0.74) \times 100$ (Robbins 1993:183) where EUN (endogenous urinary nitrogen) and MFN (metabolic fecal nitrogen) are calculated as in Parker et al. (1999) with body weights (as above).

Dietary Crude Protein Content (%) for lactation:

Peak protein requirement for a single fawn = 505 g/day of milk, with a protein content of 0.069 g/g and a digestibility coefficient of 0.95 (Sadleir 1980): $505 \times 0.069 \div 0.95 = 36.68$ g/day. Requirement for twin fawns is 1.67 times that of single fawn (Robbins 1993:213): $36.68 \times 1.67 = 61.25$ g/day.

Total requirement of dietary crude protein content = maintenance plus lactation.

Conversion of Crude Protein (CP) to Digestible Protein (DP) as follows (Hanley et al. 1992):

$$DP = -3.87 + 0.9283 (CP).$$

Hanley, T.A., C.T. Robbins, A.E. Hagerman, and C. McArthur. 1992. Predicting digestible protein and digestible dry matter in tannin-containing forages consumed by ruminants. *Ecology* 73:537-541.

Parker, K.L., M.P. Gillingham, T.A. Hanley, and C.T. Robbins. 1999. Energy and protein balance of free-ranging black-tailed deer in a natural forest environment. *Wildlife Monographs* 143:1-48.

Robbins, C.T. 1993. *Wildlife feeding and nutrition*, 2nd ed. Academic Press, New York, NY.

Sadleir, R.M.F.S. 1980. Energy and protein intake in relation to growth of suckling black-tailed deer fawns. *Canadian Journal of Zoology* 58:1347-1354.