TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE Boise, Idaho SOIL CONSERVATION SERVICE

TN - RANGE NO. 2 February 27, 1973

RANGE NUTRITION

The true value of forage is its ability to meet the grazing animal's nutritional requirements for physiological functions during various seasons of the year. The ability of plants to meet these nutritional needs varies throughout their annual life cycle.

During initial growth and for a time thereafter, all forage grasses, forbs, and shrubs are higher in nutrients and differences among classes are not great. As plants continue to develop nutritional differences become evident. Changes in chemical content of forages as a result of seasonal advance result from changes in the leaf-to-stem ratio, and normal maturing processes that cause translocation of nutrients within plant parts. In addition, digestibility decreases because of lignification and calcification of the plant material.

Graphs 1-4 illustrate the changes in digestible energy, digestible protein, carotine, and phosphorus for the three classes of plants at various growth stages.

An analysis of the nutrient content of forages shows that all classes meet the nutritional requirements of livestock in the spring, or growth period. As the season progresses, deficiencies begin to show up. These deficiencies will cause the grazing animal to shift its use to different forages as the season progresses in an attempt to meet their nutritional needs. An assortment of plants is best if all the needs of the grazing animal are to be met.

Note that when mature grasses are deficient in all nutrients except energy, and browse is low in energy and high in protein, P, and vitamin A. Vitamin A can be stored in the animal's liver for 3 to 6 months.

When developing management systems, the nutritional quality of the forage being offered to the livestock should be considered. It is possible to develop a grazing program which will meet the physiological needs of the forage plants, but one which will be inadequate to meet the nutritional needs of the grazing animal. If this is the case, or at any time when forage is deficient in nutrients, a supplementation program should be considered. Use a supplement which will overcome the deficiencies.

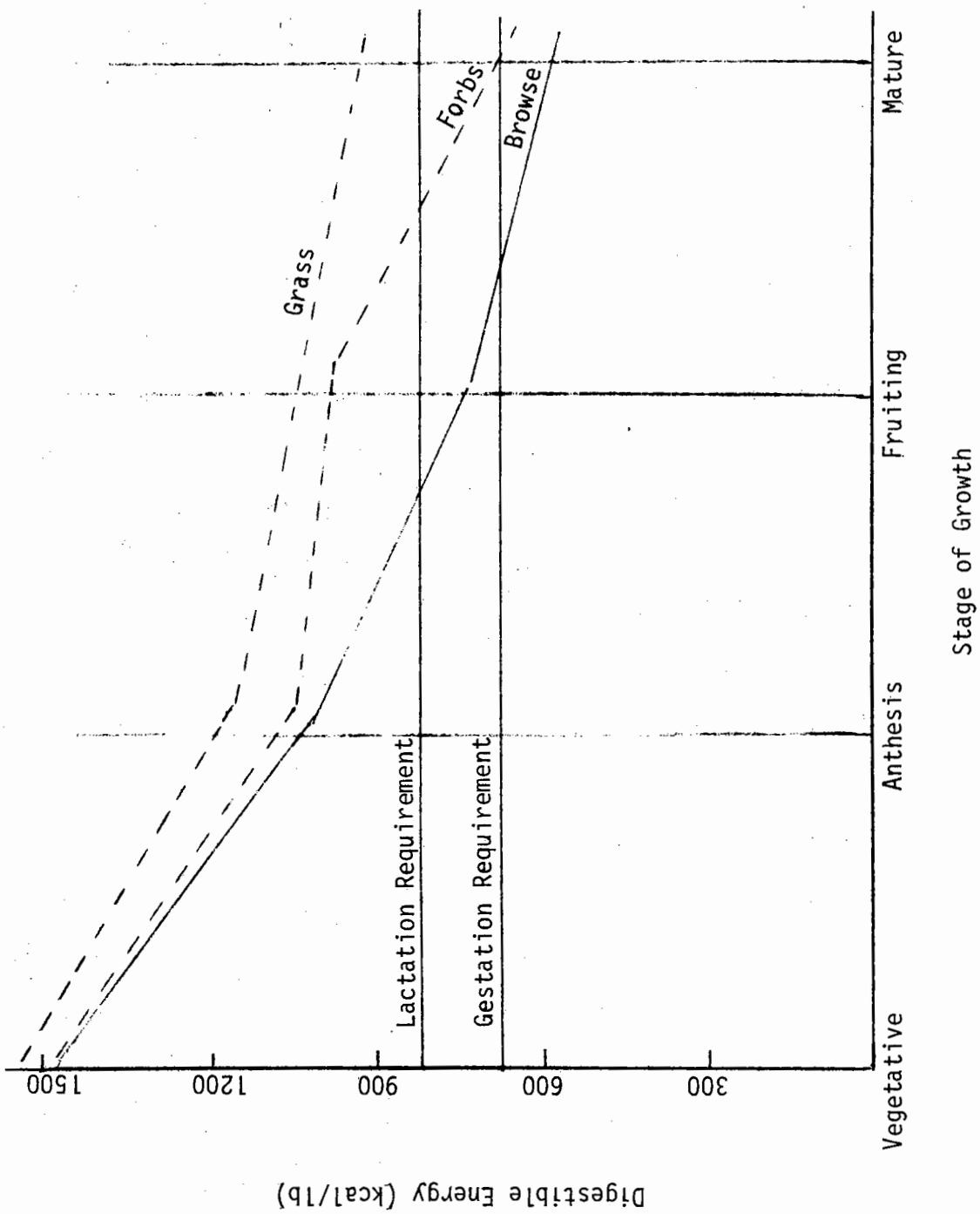
The relationships and requirements discussed are based on the assumption the grazing animals will receive enough food. If the forage supply is not adequate, it doesn't matter whether the nutrient balance is correct or not. The livestock will do poorly.

Sources of information:

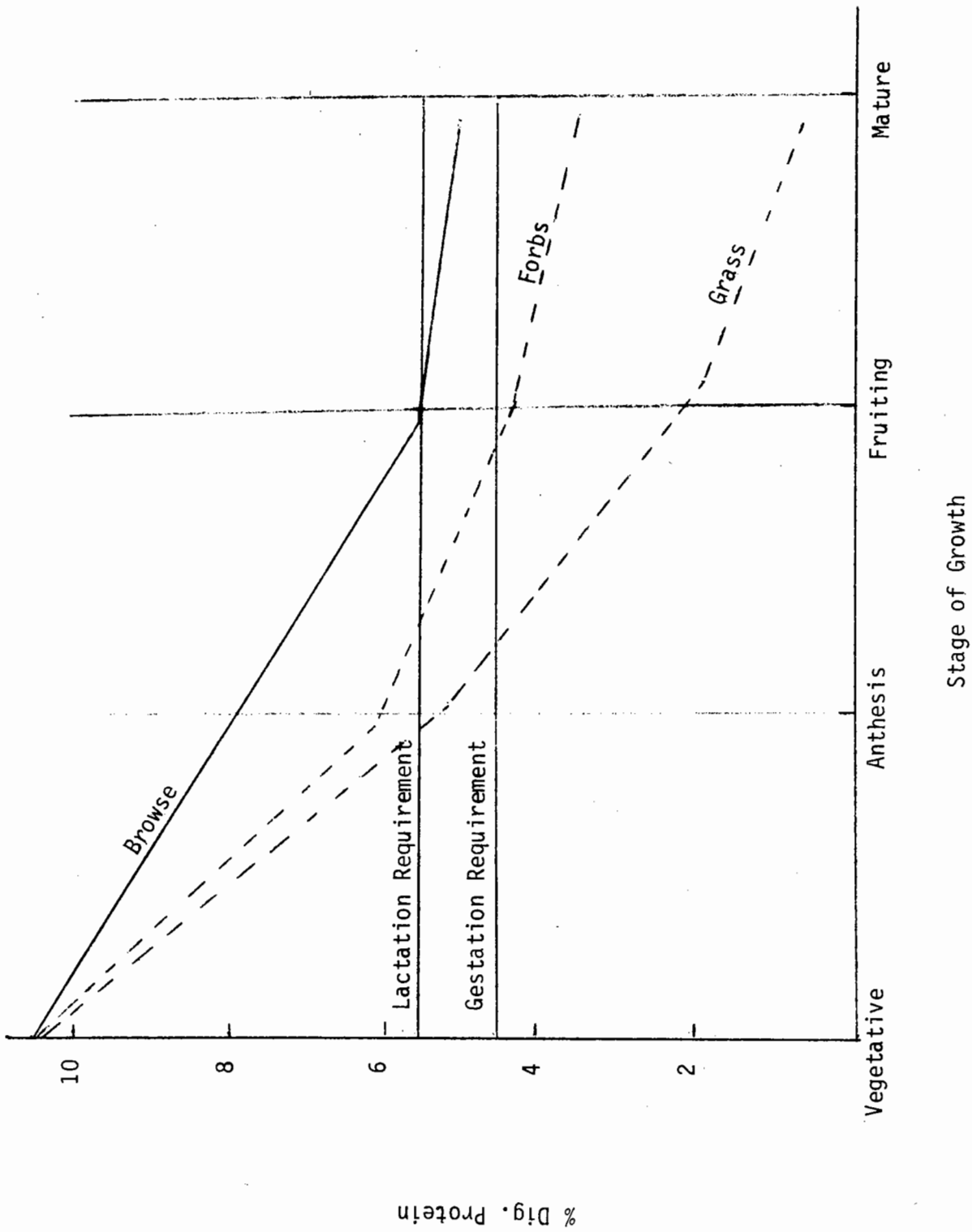
1. "The Grazier", Extension Service, Oregon State University, No. 157, December 10, 1972.

2. Cook, C. Wayne and Lorin E. Harris, Nutritive Value of Seasonal Ranges, Utah Agricultural Experiment Station Bulletin, 472, 1968.

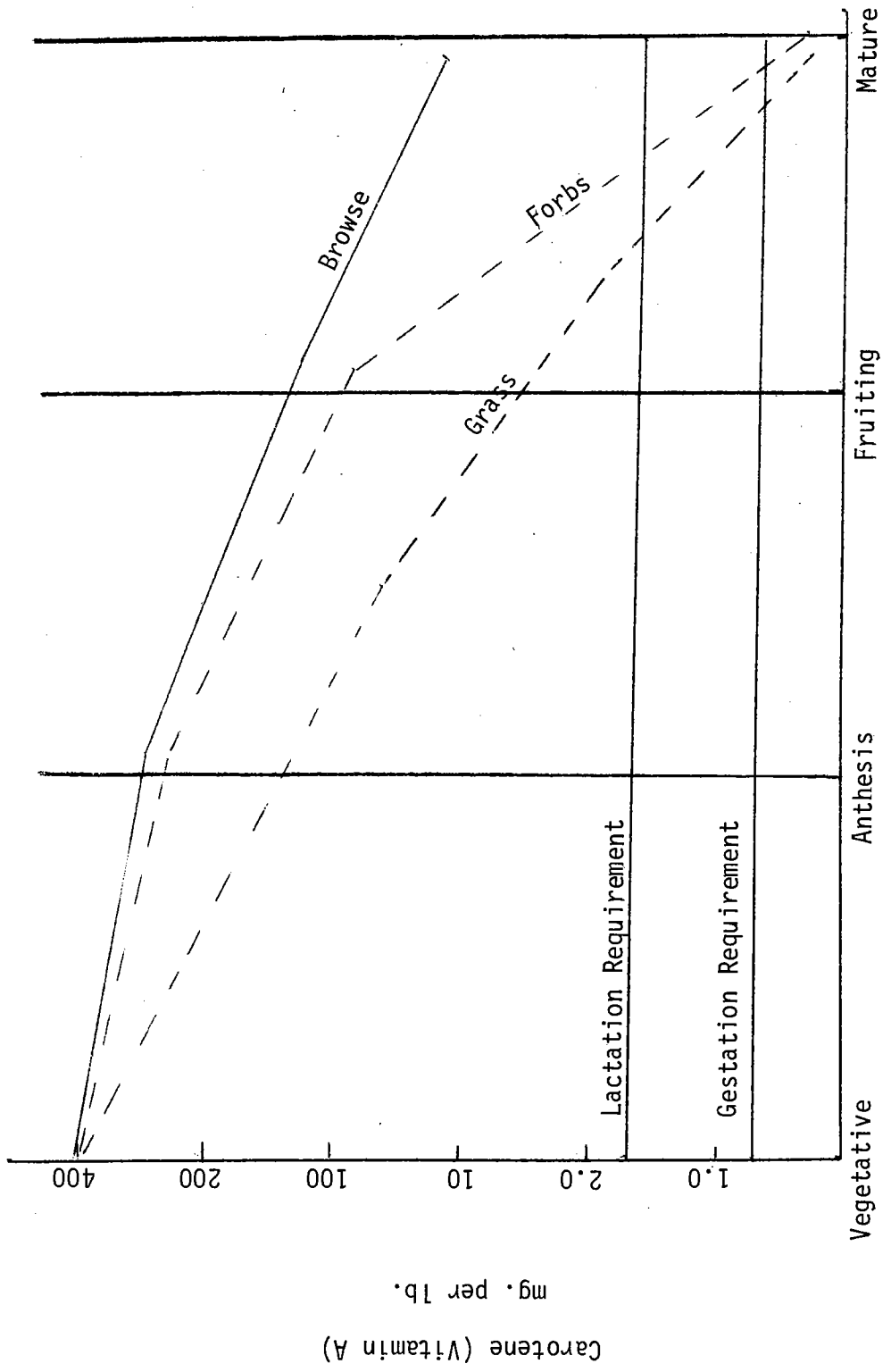
Graph 1


Digestible Energy (kcal/lb)
1500
1200
900
600
300
Grass
Forbs
Browse
Lactation Requirement
Gestation Requirement
Vegetative
Anthesis
Fruiting
Mature
Stage of Growth

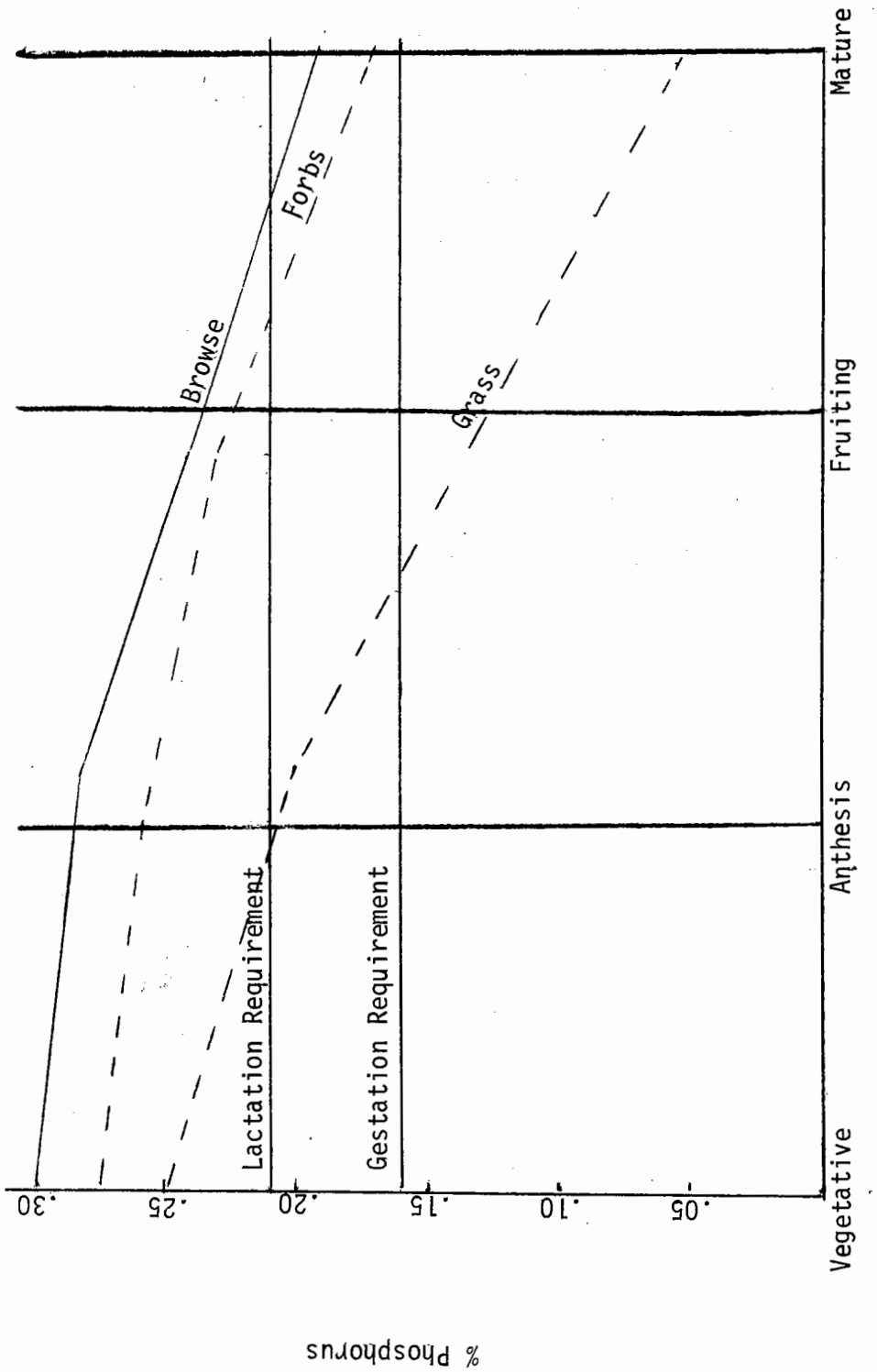
Graph 2


% Dig. Protein
10
8
6
4
2
Browse
Forbs
Grass
Lactation Requirement
Gestation Requirement
Vegetative
Anthesis
Fruiting
Mature
Stage of Growth

Graph 3


Carotene (Vitamin A)
mg. per lb.
400
200
100
10
2.0
1.0
Browse
Forbs
Grass
Lactation Requirement
Gestation Requirement
Vegetative
Anthesis
Fruiting
Mature
Stage of Growth

Graph 4


Mature
Fruiting
Anthesis
Vegetative
Stage of Growth
Browse
Forbs
Grass
Lactation Requirement
Gestation Requirement
.05
.10
.15
.20
.25
.30
% Phosphorus