horse science

4-H HORSE PROGRAM

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4-H HORSE PROGRAM

HORSE SCIENCE

This educational material has been prepared for 4-H use by the Cooperative Extension Services of the U.S. Department of Agriculture and State Land-Grant Universities in cooperation with the National 4-H Council and the American Quarter Horse Association.

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Table 1. Daily Nutrient Requirements of Horses Based on mature weight of 1000 to 1200 lbs

	Daily Feed Per Horse lbs.	Digestible Protein lbs.	Total Digestible Nutrients lbs.	Calcium grams	Phosphorus grams	Vitamin A Int'l. Units*
400 pound weaning - (age about 6 months)	11 to 12	1.0 to 1.2	8.0 to 9.0	33.0	21.0	12,000
600 to 700 pound yearling	13 to 14	1.6 to 1.8	9.0 to 10.0	33.0	21.0	16,000
800 to 1000 pound 2 year old	15 to 16	1.3 to 1.5	10.0 to 11.4	17.0	17.0	25,000
1000 lb. mature idle horse - (less than 1 hour riding daily)	16 to 17	0.6 to 0.8	6.0 to 8.1	12.0	12.0	8,000
1000 lb. horse - light work - 1 to 3 hours riding daily	16 to 17	0.8 to 1.0	8.0 to 11.0	24.0	21.0	18,000
1000 lb. horse - medium work - 3 to 5 hours riding daily	19 to 20	0.9 to 1.1	11.0 to 14.0	24.0	21.0	18,000
1000 lb. horse - hard work - more than 5 hours riding daily	22 to 23	1.2 to 1.4	14.0 to 17.0	24.0	21.0	18,000
1000 lb. breeding stallion (moderate breeding)	20 to 22	1.6 to 1.7	13.0 to 15.0	60.0	40.0	32,000
1000 lb. bred mare - light work	18 to 20	1.1 to 1.3	10.0 to 12.0	24.0	24.0	24,000
1000 lb. lactating mare	28 to 30	1.9 to 2.1	18.0 to 20.0	40.0	40.0	40,000

* Horses can use carotene to produce Vitamin A at the rate of 400 International Units of Vitamin A from 1 mg. of carotene

Your 4-H horse project offers an opportunity for you to learn how to balance a ration. To accomplish this, you must be accurate in your addition, multiplication, division and subtraction. You will be working with percentages, so be sure and watch decimal placings.

You can use Nutrient Requirement Tables in two ways: (1) to check the ration being fed to see if it is balanced, and (2) to formulate an adequate ration for your horse.

Follow this procedure in checking through the example ration and in working out a ration for your horse on the blank sheet.

1) Determine the age, weight and type of work your horse is doing.

2) Fill in Section 3 of the enclosed work sheet from Table 1, Daily Nutrient Requirements of Horses.

3) List available feeds in Section 1 of your work sheet, giving attention to each column. If you have actual analysis on your feeds, use these. If not, take average analysis from Table 2.

4) Weigh the amount of each feedstuff being fed daily. If a mixed feed is being used, you can either find out the amount of each feed ingredient that is in the mixture or use analysis of the mixture from the feed tag.

5) Multiply each figure in Section 1 by the pounds fed daily (Section 2, column 1). Record the results in the appropriate columns of Section 2 on your work sheet.

6) Add the columns in Section 2. This gives the total amount of each nutrient in your horse ration.

7) Check these totals against the "Daily Nutrient Requirements" listed in Section 3 of your work sheet. If the "requirement" is more than the totals in your ration, you will know that your ration is inadequate. Your next step is to find a feed ingredient that is a good source of the deficient nutrient and either substitute this new feedstuff for one you are now using or add this new ingredient to your horse ration. After doing this, you should refigure your totals to be sure other nutrients are not out of balance. Excesses of some nutrients can interfere with use of others in addition to being a waste of feed and money. For example, excess calcium can prevent complete utilization of phosphorus in a ration.

Table 2. Average Nutrient Content of Feeds

Feed	Digestible Protein %	Total Digestible Nutrients %	Calcium grams per lb.	Phosphorus grams per lb.	Carotene mg. per lb. ‡
Concentrates					
Rolled Oats	11.0	75.0	0.41	1.95	0.0
Corn No. 2	7.8	85.0	0.09	1.22	1.3
Rolled Milo	9.3	83.0	0.14	1.22	0.0
Rolled Barley	10.6	80.0	0.41	2.13	0.0
Wheat Bran	12.3	65.0	0.63	5.90	1.2
Wheat	14.2	75.0	0.22	1.86	1.4
Soybean Oil	42.0	78.0	1.27	2.77	0.0
Linseed Meal	30.0	75.0	1.60	3.20	0.0
Molasses	0.0	53.7	3.35	0.36	0.0
Roughages					
Timothy	4.6	51.0	1.04	0.91	10.0
Oat Hay (green)	5.0	47.3	0.95	0.86	14.0
Wheat Hay	3.8	46.7	0.95	0.86	14.0
Smooth Brome	6.1	46.3	1.63	1.18	16.7
Crested	5.4	51.0	1.00	0.60	2.2
Kentucky Blue	6.5	51.0	1.00	0.94	20.0
Prairie Hay	3.7	43.1	2.80	0.56	14.0
Clover-Timothy	5.5	46.2	4.00	0.86	6.1
Alfalfa	12.4	50.3	6.60	1.06	16.8
Ladino Clover	13.0	44.8	6.20	1.60	73.1
Red Clover	7.6	44.3	6.13	0.86	16.7
Mixed Grass	5.1	53.8	2.65	0.80	9.0
Reed Canary	4.8	45.1	1.63	0.82	7.0
Oat Straw	0.7	44.7	0.86	0.45	0.0

‡ Convert Carotene to International Units of Vitamin A by multiplying by 400

BALANCING HORSE RATIONS - WORK SHEET

Animal Mature Horse Weight 1050 Age 7 Work Classification Medium 3 to 5 hours riding daily

Section 1 **Composition of Feeds**

Feed	Digestible Protein %	T.D.N. %	Calcium grams per lb.	Phosphorus grams per lb.	Vitamin A International Units per lb. of feed
Timothy	4.6	51.0	1.04	0.91	4000
Barley	10.6	80.0	0.41	2.13	—
Molasses	0.0	53.7	3.35	0.36	—

Section 2 **Quantity of Nutrients in Feeds Being Used**

Feed	Lbs. fed	Digestible Protein lbs.	T.D.N. lbs.	Calcium gm.	Phosphorus gm.	Vitamin A I.U.
Timothy	12	0.55	6.1	12.5	10.9	48000
Barley	5	0.53	4.0	2.1	10.7	—
Total	17	1.08	10.1	14.6	21.6	48000

Section 3 **Daily Nutrient Requirements**
(Based on air-dry feed containing 90 percent dry matter)

Size and Use of Horse	Lbs. fed	Digestible Protein lbs.	T.D.N. lbs.	Calcium gm.	Phosphorus gm.	Vitamin A I.U.
1050# Mod. Work	19 to 20	0.9 to 1.1	110 to 140	24.0	21.0	18000

Section 4 **Balancing Ration and Meeting Requirements**

Total from Section 2	17	1.08	10.1	14.6	21.6	48000
Ration deficiency	1 to 3	—	0.9 to 3.9	9.4	—	—
Supplement Molasses	3	—	1.6	10.1	1.1	
Balanced ration	20	1.08	11.7	24.7	22.7	48000

BALANCING HORSE RATIONS - WORK SHEET

Animal_____ Weight_____ Age_____ Work Classification_____

Section 1 Composition of Feeds

Feed	Digestible Protein %	T.D.N. %	Calcium grams per lb.	Phosphorus grams per lb.	Vitamin A International Units per lb. of feed

Section 2 Quantity of Nutrients in Feeds Being Used

Feed	Lbs. fed	Digestible Protein lbs.	T.D.N. lbs.	Calcium gm.	Phosphorus gm.	Vitamin A I.U.
Total						

Section 3 Daily Nutrient Requirements (Based on air-dry feed containing 90 percent dry matter)

Size and Use of Horse	Lbs. fed	Digestible Protein lbs.	T.D.N. lbs.	Calcium gm.	Phosphorus gm.	Vitamin A I.U.

Section 4 Balancing Ration and Meeting Requirements

Total from Section 2						
Ration deficiency						
Supplement						
Balanced ration						

NOTES

1. This document is section 10 of 14 of 4HHSG01, which supersedes CO 201, one of a series of the 4-H Youth Development Program, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Date first printed August 1965. Date revised June 1989. Please visit the FAIRS Website at **http://hammock.ifas.ufl.edu**.

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