GUIDE

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Nutrient Requirements of Swine

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Table 1. Nutrient Requirements of Growing Swine

	10-25	25-45	45-75	75-135	135-220	Live Weight (lbs)		10-25	25-45	45-75	75-135	135-220
	Daily Gain (lbs)						Fe	ed Intak	e (lbs)			
	.66	1.1	1.32	1.65	2.00			1.30	2.75	3.75	5.50	7.75
	Perce	entage or	amount	pound of	diet			An	nount pe	r animal	ner dav	
						PROTEIN AND ENERGY			real Po	***************************************	per au	
%	20	18	16	14	13	Crude protein	lb	.22	.40	.53	.62	.85
kcal	1591	1532	1536	1540	1543	Digestible energy	kcal	1750	3370	5055	6740	10110
						INORGANIC NUTRIENTS						
%	.80	.65	.60	.55	.50	Calcium	g	4.0	6.5	9.0	11.0	15.0
%	.60	.55	.50	.45	.40	Phosphorus	g	3.0	5.5	7.5	9.0	12.0
%	.10	.10	.10	.10	.10	Sodium	g	.5	1.0	1.5	2.0	3.0
%	.13	.13	.13	.13	.13	Chlorine	g	.7	1.3	2.0	2.6	3.9
%	.26	.26	.23	.23	.20	Potassium	g	1.3	2.6	3.5	4.0	5.1
						VITAMINS						
mg	4.0	3.2	2.4	2.4	2.4	Beta-Carotene	mg	4.4	7.0	7.8	10.4	15.6
IU	1000	795	591	591	591	Vitamin A	IU	1100	1750	1950	2600	3900
IU	100	91	91	68.2	56.8	Vitamin D	IU	110	200	300	300	375
mg	5.0	5.0	5.0	5.0	5.0	Vitamin E	mg	5.5	11.0	17.0	22.0	33.0
mg	.9	.9	.9	.9	.9	Vitamin K	mg	1.1	2.2	3.3	4.4	6.0
mg	.59	.50	.5	.5	.5	Thiamine	mg	0.65	1.1	1.7	2.2	3.3
mg	1.36	1.36	1.18	1.0	1.0	Riboflavin	mg	1.5	3.0	3.9	4.4	7.0
mg	10.0	8.18	6.36	5.45	4.54	Niacin	mg	11.0	18.0	21.0	24.0	30.0
mg	5.9	5.0	5.0	5.0	5.0	Pantothenic acid	mg	6.5	11.0	17.0	22.0	33.0
mg	.68	.68	.5	.5	.5	Vitamin B ₆	mg	0.75	1.5	1.7	2.2	3.3
mg	500	409	318	250	182	Choline	mg	550	900	1050	1100	1200
mcg	10.0	6.82	5.0	5.0	5.0	Vitamin B ₁₂	mcg	11.0	15.0	17.0	22.0	33.0
						AMINO ACIDS						
%	.25	.23	.20	.18	.16	Arginine	g	1.3	2.3	3.0	3.6	4.8
%	.23	.20	.18	.16	.15	Histidine	g	1.2	2.0	2.7	3.2	4.5
%	.63	.56	.50	.44	.41	Isoleucine	g	3.2	5.6	7.5	8.8	12.3
%	.75	.68	.60	.52	.48	Leucine	g	3.8	6.8	9.0	10.4	14.4
%	.95	.79	.70	.61	.57	Lysine	g	4.8	7.9	10.5	12.2	17.1
% %	.56	.51	.45	.40	.30	Methionine + cystine	g	2.8	5.1	6.8	8.0	9.0
	.88	.79	.70	.61	.57	Phenylalanine + tyrosine	g	4.4	7.9	10.5	12.2	17.1
%	.56	.51	.45	.39	.37	Threonine	g	2.8	5.1	6.8	7.8	11.1
%	.15	.13	.12	.11	.10	Tryptophan	g	0.8	1.3	1.8	2.2	3.0
%	.63	.56	.50	.44	.41	Valine	g	3.2	5.6	7.5	8.8	12.3

Table 2. Nutrient Requirements of Breeding Swine: Percentage or Amount Per Pound of Diet

	Bred Gilts and Sows; Young and Adult Boars	Lactating Gilts and Sows		Bred Gilts and Sows; Young and Adult Boars	Lactating Gilts and Sows
Nutrients	Requiremen	nts	Nutrients	Requireme	nts
ENERGY AND PROTE Digestible energy (kcal) Crude protein (%)	EIN 1,545 12	1,545	INORGANIC NUTE Calcium Phosphorus NaCl (salt) Potassium		.75 .50 .5

Table 2. CONTINUED. Nutrient Requirements of Breeding Swine: Percentage or Amount Per Pound of Diet

	Bred Gilts and Sows; Young and Adult Boars	Lactating Gilts and Sows		Bred Gilts and Sows; Young and Adult Boars	Lactating Gilts and Sows	
Nutrients	Requiremen	nts	Nutrients	Requirements		
VITAMINS			AMINO ACIDS (%)			
Beta-carotene (mg)	7.2	3.6	Arginine	<u> </u>	.4	
Vitamin A (IU)	1,818	909	Histidine	.15	.25	
Vitamin D (IU)	140	90	Isoleucine	.37	.39	
Vitamin E (mg)	4.5	4.5	Leucine	.42	.70	
Vitamin K	.9	.9	Lysine	.43	.58	
Thiamine (mg)	.45	.45	Methionine + cystine	.23	.36	
Riboflavin (mg)	1.3	1.3	Phenylalanine + tyrosine	.52	.85	
Niacin (mg)	4.5	4.5	Threonine	.34	.43	
Pantothenic acid (mg)	5.4	5.4	Tryptophan	.09	.12	
Vitamin B ₁₂ (mcg)	6.8	6.8	Valine	.46	.55	

Table 3. Trace Mineral Requirements

,			Growing and	d Finishing			
Live Wt., lbs	10-25	25-45	45-75	75-135	135-220	Bred Sows & Boars	Lactating Sows
MINERAL							
Magnesium, %	.04	.04	.04	.04	.04	.04	.04
Iron, mg	140	80	60	50	40	80	80
Zinc, mg	100	80	60	50	50	50	50
Manganese, mg	4	3	2	2	2	10	10
Copper, mg	6	5	4	3	3	5	5
Iodine, mg	.14	.14	.14	.14	.14	.14	.14
Selenium, mg	.15	.15	.15	.15	.10	.15	.15

Table 4. Partial Composition of Feeds Commonly Used in Swine Rations (as-fed-basis)

	Crude	Digestible				Amino Acids	
Feedstuff	Protein %	Energy Kcal/lb.	Calcium %	Phosphorus %	Lysine %	Methionine + Cystine (%)	Tryptophan %
Corn dent U.S. #2	8.8	1602	.02	.28	.24	.40	.05
Grain Sorghum	8.9	1563	.03	.28	.22	.30	.10
Wheat	10.2	1663	.05	.31	.31	.40	.12
Oats	11.4	1303	.06	.27	.40	.40	.16
Soybean Meal (44%)	44	1523	.29	.65	2.93	1.40	.62
Soybean Meal (50%)	48.5	1755	.27	.62	3.18	1.40	.67
Meat & Bone Meal	50.4	1303	10.10	4.96	2.60	1.00	.28
Fish Meal (me.)	60.5	1243	5.11	2.88	4.83	2.40	.68
Alfalfa Meal	17.5	1173	1.44	.22	.73	.40	.28
Dicalcium Phosphate	_	_	22	18.50	_	_	_
Limestone	_	_	38		_	_	_
Steamed Bone Meal	_	_	24	12.6	_	_	_

Table 5. Symptoms of Dietary Excesses of Certain Required Inorganic Elements

Element	Toxic Level	Age	Symptoms
Calcium	1% (with limited zinc or phosphorus)	Immature	Depressed appetite, reduced gain
Copper	135-225 mg/lb (in absence of higher levels of dietary iron and zinc) ^a	Immature	Reduced growth, lower hemoglobin, icterus, and death ^b
Iodine	365 mg/lb	Immature	Depressed feed intake and rate of gain, lowered hemoglobin and eye lesions
Iron	2275 mg/lb	Immature	Depressed feed intake and rate of gain, reduced serum inorganic phosphorus and femur ash, rickets
Manganese	1820 mg/lb	Immature	Depressed feed intake, reduced growth rate, stiffness and stilted gait
Selenium	2.3-3.6 mg/lb	Immature	Hoof separate from coronary bands, emaciation, loss of hair, cirrhosis and atrophy of liver
	4.5 mg/lb	Breeding (sows)	Reduced conception; pigs small, weak, or dead at birth
Sodium and chlorine (salt)	6-8% (if limited water is available)	All ages	Nervousness, staggering, weakness, paralysis, and death
Zinc	910 mg/lb	Immature	Reduced performance, arthritis, extensive hemorrhage and gastritis

^aIn a few instances, a dietary level of 115 mg/lb has resulted in symptoms of excess.

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^bIn some instances, 225 mg/lb of copper has been fed without icterus or death occurring.

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