1983

Figuring Feeds for Swine

Cooperative Extension South Dakota State University

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

For current policies and practices, contact SDSU Extension

Website:	extension.sdstate.edu
Phone:	605-688-4792
Email:	sdsu.extension@sdstate.edu

FS 366
(Revised)

Figuring Feeds for SWINE

Cooperative Extension Service
South Dakota State University, Brookings
U. S. Department of Agriculture

Figuring Feeds for Swine

By
LaVerne J. Kortan, livestock specialist, Cooperative Extension Service, and **Richard C. Wahlstrom,** professor of animal science, Agricultural Experiment Station, SDSU.

The progressive swine grower wants optimum preformance from his animals. Adequate amounts of nutritionally balanced rations are necessary for this performance. A balanced ration, strictly speaking, is a combination of feeds furnishing the various nutrients in such proportions, amounts, and form that will, without waste, properly nourish a given animal or group of animals for a particular purpose.

A balanced swine feed contains two types of feed: (1) the cereal grains and similar feeds that make up a large portion of the ration and are used primarily for the energy they contain; and (2) supplemental feeds to increase the protein, minerals and vitamins to proper levels.

Rapid and economical gains are important to efficient swine production. For this reason palatability is an important factor in determining the economic value of swine feeds. Although most farm grains are palatable, it is important in selecting feeds to be familiar with their differences. Tables 1 and 2 explain some of these differences. Table 3 is a guide in determining those feeds which may be most economical in formulating swine rations.

VITAMINS

Rations formulated for drylot feeding usually need an addition of vitamins A and D, riboflavin, pantothenic acid, niacin, choline and vitamin B_{12}. The addition of vitamin A is important when mixing rations with cereal grains. Swine raised without direct sunlight should receive supplemental vitamin D.

Pasture and alfalfa meal are good sources of vitamins. Therefore, supplemental vitamins may be reduced for hogs raised on pasture. The amount needed depends on the quality of the pasture. In this case, no rule of thumb can be substituted for good management.

The recommended content of vitamins in complete rations is shown in Table 4.

MINERALS

The pig can utilize only about one third of the phosphorus found in plant feedstuffs (corn, milo, soybean meal, etc.). Because of this, rations formulated from grain and plant protein require added available phosphorus. A rule of thumb to follow: use the calcium and phosphorus requirement as shown in Table 5. This will give the recommended ratio between total calcium and total phosphorus. Most rations will require adding a mineral supplement containing both calcium and phosphorus.

If a complete mineral supplement is used for preparing the ration, the calcium-phosphorus ratio in the supplement should not exceed 1.6:1. Such a ratio should give a 1:1 ratio between calcium and phosphorus in a complete corn-soybean ration.

PARAKERATOSIS

The combination of a high level of calcium (over 0.8%) and an inadequate level of zinc may cause a nutritional disease known as parakeratosis. The condition can be identified by the mangy-like appearance of the animal. The skin becomes dry and scaly, particularly on the hind legs, tail, and under region of the body. It can be corrected by keeping the level of calcium below 0.8% or by adding zinc as indicated in Table 5. Trace mineralized salt containing 1.0% zinc may also be used.

ANTIBIOTICS, OTHER ANTI-BACTERIAL AGENTS, ARSENICALS AND FEED ADDITIVES

Antibiotics, other anti-bacterial agents, and arsenicals are widely used in swine rations. They are not nutrients in themselves, but they are known to discourage growth of harmful organisms in the digestive tract. They also may aid in making nutrients more available for assimilation.

Antibiotics usually are added to growing-finishing swine rations. Benefits vary from farm to farm. Experimental results indicate variations from excellent improvement in gains (10-20 percent) and feed efficiency to no improvement.

Table 1. Feed substitutions for swine (grain, by-products, feeds, roots and tubers).

Feedstuff	Relative feeding value (pound for pound) compared to No. 2 corn with value of 100	Remarks
Corn, No. 2	100	Corn is leading U. S. swine feed. About 50% of total production is fed to hogs.
Barley	90-100	Should be ground or fed as a pellet. Can replace 100% base feed if desired.
Millet	85-95	Feed not more than 50% of base feed for best results.
Oats	80-100	For growing finishing pigs, oats equals corn when limited to ⅓ of ration. The feeding value varies according to test weight per bushel. Grind fine for swine.
Potatoes	25-28	Not palatable in raw state; must be cooked. Feed not more than 25% to 40% of base feed for best results.
Rye	90	Feed not more than 50% of base feed for best results. It's somewhat unpalatable and should be limited. Do not feed to breeding animals.
Sorghum, grain	90-94	Grind when fed. Can replace 100% of base feed.
Wheat	100-105	Grind and mix as a complete ration, can self-feed whole with supplement free-choice.
Wheat bran	75	Feed 15% to 25% of base ration. Bran is particularly valuable at farrowing time.
Black strap molasses	59	No more than 5% molasses should be used in swine ration. It takes 1.69 pounds molasses to equal 1 pound of corn.

Using Arsenicals in the Ration

Besides their growth-promoting effect, arsenicals may also help where scours is a problem. Arsenicals can be added in the form of arsanilic acid, 90 grams per ton of complete feed, or 3-nitro-4-hydroxy phenyl-arsonic acid (3-nitro) at 22.7 grams per ton of complete feed.

Feed Additive Withdrawals

The use of feed additives is regulated by the Food and Drug Administration. The Animal-Plant Health Inspection Service (APHIS) of the USDA and the state feed regulatory agencies are responsible for compliance with the FDA regulations and are actively initiating more rigid controls on monitoring feed levels and pork carcasses for feed additive residues. Every pork producer must take precautions to abide by the FDA regulations on removal of certain additives before selling hogs for slaughter. Misuse of additives cannot be tolerated. Read the feed tag!

WATER ALLOWANCES

Hogs, of course, require more water in hot than in cool weather. In temperatures below freezing, equip automatic waterers with heat to keep ice from forming. Table 7 gives average water consumption of pigs on full rations. A rule of thumb to remember is that growing and finishing hogs will drink about two to three pounds of water for each pound of feed consumed.

Table 2. Feed substitution for swine (protein concentrates)*

Feedstuff	Relative feeding value (lb. for lb.) compared to soybean meal with value of 100	Lbs. needed to equal 1 lb. soybean meal	Remarks
Soybean meal (44% Protein)	100	1	Soybean meal is an outstanding source of supplementary amino acids for feeding swine and will satisfy the required amino acids for a supplement fed with corn.
Linseed meal	86	1.23	Usually the price of linseed meal in comparison with soybean meal will determine the extent to which it will be used in most rations. Linseed meal has laxative properties, and is a good addition to brood sow rations before and after farrowing. Large amounts should not be fed because of danger of scours in the young pigs. Linseed meal gives best results when fed at a level of 5 to 25% of the protein supplement used in balancing a ration.
Sunflower seed meal, well-hulled	82	88	Sunflower-seed meal can be used as part (about one-third) of the protein-vitamin supplement for pigs fed in dry lot.
Sunflower seed meal, solv.	80	86	
Fish meal, Menhaden	118	.85	Usually superior to tankage and meat scraps. However, due to higher cost, it is usually limited to 1 to 3% of the ration or 5 to 30% of protein supplement.
Meat and bone scraps (50% Protein)	101	.99	Use limited amount, not over 5% of total ration, due to high calcium content.
Tankage (60% Protein)	110	.91	Use limited amount, not over 5% of total ration, due to high calcium content.
Blood meal	123	.81	The protein is apparently not of as high nutritive value as that of meat scrap or tankage.
Skim milk, buttermilk, dried	96	.104	These milk products contain 32 to 35% protein, but are usually too expensive to be economical protein supplements for swine.
Skim milk, buttermilk liquid	9-15		Pound for pound these are worth 1/10 as much as dried skim milk. One hundred pounds skim milk (liquid) is equal to ½ bushel of corn or 12 pounds of tankage. This is when fed in recommended amounts for balancing ration.
Liquid whey			In general, whey has a feeding value equal to about ½ that of skim milk or buttermilk. Pigs fed whey should be gradually accustomed to it, then fed free choice.
Condensed whey			Based on their respective nutrient contents, 1 pound of condensed whey should be worth about 9 pounds of liquid whey for hogs.
Dried whey (milk sugar feed)			It is high in lactose (milk sugar), containing at least 65% and rich in riboflavin, pantothenic acid, and some of the important unidentified factors. One pound of dried whey contains about the same nutrients as 13 to 14 pounds of liquid whey.
Dried whey product			When price relationships warrant dried whey product may replace alfalfa meal in drylot rations for swine on a comparable protein content basis.
Cheese rind (cheese meal)			It is slightly more valuable than tankage as a swine feed.

*Roots and tubers are of lower value than the grain and by-product feeds due to their high moisture content.

Table 3. Relative cost values of feeds for hogs.

Relative feeding val. per lb compared with corn	%	Unit	Equivalent prices of other feeds when price per bushel of corn is $2.50	$2.60	$2.70	$2.80	$2.90	$3.00	$3.10	$3.20
Oats	85	Bushel	1.21	1.26	1.31	1.36	1.41	1.46	1.51	1.55
Barley	95	Bushel	2.04	2.11	2.56	2.65	2.75	2.85	2.94	3.03
Wheat	105	Bushel	2.81	2.92	3.03	3.15	3.26	3.37	3.48	3.59
Rye	85	Bushel	2.12	2.21	2.30	2.38	2.46	2.54	2.63	2.71
Sorghum	90	100 lb	4.01	4.18	4.34	4.50	4.66	4.82	4.98	5.14

Table 4. Vitamin requirements, per ton according to pig weight.

Vitamin	10-30 lb	30-50 lb	50 lb to market	Breeding stock
	Amount per ton of complete feed			
Vitamin A (million IU)*	4	4	2.4	4
Vitamin D (million IU)*	.40	.40	.24	.4
Riboflavin (gm)	5	3	3	5
Niacin (gm)	35	35	21	35
Pantothenic acid (gm)	22.5	22.5	14	22.5
Choline (gm)	100			400
Vitamin B_{12} (mg)	25	25	15	25

*IU—International Units

Table 5. Mineral requirements according to pig weight (% of diet).

Mineral	10-30 lb	30-50 lb	50-125 lb	Market weight	Breeding stock
Calcium %	.80	.65	.60	.50	.60
Phosphorus%	.70	.60	.60	.50	.60
Salt % (chlorine and sodium)	.30	.30	.30	.30	.30
Zinc, gm/T	100	80	60	60	60
Iodine, gm/T	.15	.15	.15	.15	.15
Iron, gm	140	80	60	50	50

Table 6. Mineral sources.

Mineral	Source
Calcium	Ground limestone
Calcium and phosphorus	Dicalcium phosphate, steamed bone meal
Phosphorus	Monosodium and disodium phosphate
Sodium and chlorine	Salt
Iodine	Iodized salt, trace mineralized salt, and trace mineral mixes
Iron (baby pigs)	Iron injections, clean soil, pills or pastes containing iron
Iron (growing and mature pigs)	Iron sulfate, trace mineral mixes, trace mineralized salt
Zinc	Zinc carbonate, zinc sulfate, zinc oxide, trace mineral mixes, trace mineralized salt
Copper, cobalt, potassium, magnesium, manganese, and sulphur—Usually adequate in natural feedstuffs.	

Table 7. Water consumption of pigs on full rations.

Weight of Pigs (lbs)	Approximate water consumption free choice daily per pig (lbs.) Spring pigs	Fall pigs
25	3.3	2.5
50	5.5	4.5
75	8.5	7.0
100	9.0	7.5
150	10.0	9.0
200	9.0	9.6
250	7.5	7.5
300	6.0	6.0
350	5.3	5.3
400	5.2	5.2

Table 8. Feed consumption and efficiency of gains of pigs reaching various weights.

Live weight of pig (lb)	Cumulative feed per pig (lb)	Feed per 100-lb gain during period* (lb)
35 (wean.wt.)	204 +	
50	255	338
75	342	347
100	432	361
125	526	376
150	624	392
175	706	408
200	813	427
225	925	448
250	1042	470
275	1166	496
300	1296	523

*10% to 20% reduction in feed need per 100 pounds of gain is possible if recommended selection, feeding, management, disease, and sanitation programs are closely followed.

+ The feed amount shown includes one pig's share of the feed consumed by the breeding herd (sow and boar) and litter up to weaning, based upon a 7.2 average pig litter size. This amount will decrease approximately 25% if sow is limit-fed during gestation.

Table 9. Recommended levels of antibiotics per ton of complete feed.

Ration	Grams Per Ton
Starter (18%)	50-100 gm.
Grower (16%)	20-40 gm.
Growing-Finish (14%)	10-20 gm.
Growing-Finish (12%)	0-20 gm.

PELLETING

Experimental data on pelleted, growing-finishing corn rations show that pigs gain approximately 0.1 pound per day faster and save about 6 pounds of feed per 100 pounds of body weight gain. Normally this improvement is inadequate to justify the cost of pelleting. This is especially true during the growing and finishing period. It appears economical to pellet barley and rations containing high amounts of fibrous feeds, such as oats, alfalfa, or poor quality, unpalatable feeds. Pelleting improves the consumption of these feeds and reduces wastage.

HIGH MOISTURE CORN

Studies conducted at midwest universities indicate that growing and finishing pigs may not properly balance their ration when high-moisture corn and supplement are fed free-choice.

Rate of gain and feed efficiency, when compared on an equivalent dry matter basis, have been essentially the same for pigs fed high-moisture or dry corn in studies where corn and supplement are mixed together rather than fed free-choice.

There is no apparent advantage to cracking high-moisture corn for growing and finishing swine.

The possible use of high-moisture corn in a swine feeding system is primarily an economic decision rather than a nutritional one. Thus, the various costs involved should be carefully studied for each individual case before a sound decision can be made.

DRYLOT AND PASTURE

Growing-finishing pigs gain slightly faster when raised in confinement. Their ration should be about the same as for pigs raised on pasture. Alfalfa, red clover, rye, and rape pasture provide an excellent source of vitamins, but weather conditions and seasons vary to the extent that pasture is not always succulent and palatable.

Climatic conditions also affect the pigs' grazing habits—forage consumption will be less in hot weather. Rations may contain less vitamins and a 2% lower protein level when the pasture is succulent; otherwise, the ration must contain adequate amino acids, vitamins, and minerals.

Table 11 illustrates suitable complete rations and protein supplements for growing-finishing swine. Substitutions may be made as indicated in Table 2.

FEED COSTS

Feed makes up about 55 to 70% of the costs in producing pork. This means it is the most important single expense. Of the total feed costs, the breeding herd accounts for 30%, while 70% is chargeable to raising pigs from weaning to market.

Tables 8, 12, and 13 show how to estimate feed costs and calculate feed requirements during various parts of the hog production cycle. Table 8 shows the average cumulative feed consumption (including pigs share of breeding stock feed) and feed efficiency for pigs of various weights. Tables 12 and 13 are for calculating feed requirements and costs for growing-finishing pigs. Table 10 gives an example of two good home-mixed protein supplements.

SUGGESTED RATIONS

Tables 14 through 17 are example rations for pigs of various weights.

Table 10. 36% protein supplement.

Ingredient	Lb.	Lb.
44% Soybean meal	1535	1070
50% Meat and bone scraps		400
17% Dehydrated alfalfa	175	300
Calcium Carbonate		70
Dicalcium phosphate	180	40
Salt (iodized)*	50	60
Trace mineral mix*	10	10
Vitamin antibiotic premix †, ‡	50	50
	2000	2000
Calculated analysis:		
Protein, %	36.00	36.09
Fat, %	.56	2.37
Fiber, %	7.18	7.73
Calcium, %	2.67	4.22
Phosphorus, %	2.14	1.74

*The trace mineral mix and/or iodized salt should supply: 450 grams zinc; 1.0 gram iodine; 450 grams iron; and 50 pounds of salt per ton of supplement.

†The vitamin-antibiotic premix should supply 15,000,000 I.U. Vitamin A; 2,000,000 I.U. Vitamin D; 10.0 grams riboflavin; 70.0 grams niacin; 40 grams calcium pantothenate; 500 grams choline; 50.0 mgs.; vitamin B_{12}; and 100 to 250 grams of antibiotic or comparable equivalent of arsenicals per ton of supplement if feed additives are used.

‡If this is fed sows, the Vitamin A level should be increased to 25,000,000 I.U. per ton of supplement.

Table 11. Amount of supplement needed with corn or milo to formulate rations at different levels of protein. (Grain figured at 8.8% protein.)

Percent protein in supplement		Percent protein in total ration								
		10	11	12	13	14	15	16	17	18
36	Grain	1912	1838	1765	1691	1618	1544	1471	1397	1324
	Supplement	88	162	235	309	382	456	529	603	676
	Lbs. grain per 1 lb. suppl.	21.7	11.4	7.5	5.5	4.2	3.4	2.8	2.3	2.0

Table 12. Calculation of ration cost.*

	Pounds	Price/ pound (Cents)	Total
Ground yellow corn	1750	5.5	$96.25
Soybean meal	200	10.0	20.00
Trace mineral salt	10	7.0	.70
Limestone	15	3.6	.54
Dicalcium Phosphate or steamed bone meal	25	14.0	$3.50
Vitamin addition Approximate cost of all additives that are used			$8.50
TOTAL	2000		$129.49
Grinding and mixing cost (30¢/100 lb)			$6.00
Total cost, including grinding and mixing cost			$135.49

*12.3% protein

Table 13. Pound-bushel-ton equivalents*

When a ton of grain, complete mixed feed or protein supplement is worth:	A bushel is worth + Corn (56 lb) 35.71 bu/T	Oats (32 lb) 62.50 bu/T	Barley (48 lb) 41.66 bu/T	A pound is worth:
$90	2.52	1.44	2.16	4.5¢
96	2.69	1.53	2.30	4.8¢
102	2.85	1.63	2.45	5.1¢
108	3.02	1.73	2.59	5.4¢
114	3.19	1.82	2.73	5.7¢
120	3.36	1.92	2.88	6.0¢
126	3.52	2.02	3.02	6.3¢
132	3.70	2.11	3.17	6.6¢
138	3.86	2.21	3.31	6.9¢
144	4.03	2.30	3.46	7.2¢
150	4.20	2.40	3.60	7.5¢
156	4.37	2.50	3.74	7.8¢
162	4.54	2.59	3.89	8.1¢
168	4.70	2.69	4.03	8.4¢
174	4.87	2.78	4.18	8.7¢
180	5.04	2.88	4.32	9.0¢
186	5.21	2.98	4.46	9.3¢
192	5.38	3.07	4.61	9.6¢
198	5.54	3.16	4.75	9.9¢
204	5.71	3.26	4.90	10.2¢

*Feed prices are constantly changing. To make realistic estimates when calculating ration cost, this table is designed to quickly provide equivalent cost figures for grain, complete mixed feed, or protein supplement either by the pound, bushel, or ton quality.

+ Cost of grain sorghum is not given for a bushel; it is generally sold by the hundredweight.

Table 14. 18% pig starter.

Percent protein	Ingredients	1	2	3	4
8.8	Ground yellow corn	987	770	1092	1380
16.0	Rolled oats		500		
50.0	Solvent soybean meal		360		
44.0	Solvent soybean meal	550		350	550
33.0	Dried skimmilk		200	300	
32.0	Fish solubles			50	
12.0	Dried whey (high lactose)	300			
	Stabilized fat			50	
	Cane or beet sugar	100	100	100	
	Calcium carbonate (38% Ca)	10	12	10	6
	Dicalcium phosphate (26% Ca., 18% P.)	25	28	20	40
	Iodized salt	5	7	5	5
	Trace mineral premix	3	3	3	3
	Vitamin premix***	20	20	20	20
	Antibiotics***	+	+	+	+
	TOTAL	2000		2000	
Calculated Analysis:					
	Protein, %	18.24	18.30	18.25	18.31
	Fat, %	2.09	2.83	4.84	2.77
	Fiber, %	3.16	2.82	2.60	3.52
	Calcium, %	0.72	0.77	0.69	0.71
	Phosphorus, %	0.62	0.59	0.58	0.71

Table 15. 16% pig grower rations (for pigs from 30 to 75 lbs).

Percent protein	Ingredients	1	2	3	4	5	6
8.8	Ground yellow corn or grain sorghum	1488	1470	1550	1303	1058	-----
11.0	Ground barley	-----	-----	-----	-----	-----	1638
12.0	Ground oats	-----	-----	-----	200	500	-----
50.0	Meat and bone scraps	-----	-----	80	-----	-----	-----
44.0	Solvent soybean meal	450	420	330	435	380	300
17.0	Dehydrated alfalfa	-----	50	-----	-----	-----	-----
	Calcium carbonate (38% Ca.)	15	4	6	15	12	10
	Dicalcium phosphate (26% Ca., 18% P.)	25	38	12	25	28	30
	Iodized salt	10	10	10	10	10	10
	Trace mineral premix	2	2	2	2	2	2
	Vitamin premix***	10	10	10	10	10	10
	Antibiotics	+	+	+	+	+	+
	Total	2000	2000	2000	2000	2000	2000
Calculated Analysis:							
	Protein, %	16.48	16.18	16.33	16.50	16.16	16.00
	Fat, %	2.94	2.85	3.39	2.98	3.58	1.68
	Fiber, %	3.44	3.77	3.11	4.35	5.48	4.78
	Calcium, %	0.67	0.67	0.72	0.68	0.70	0.66
	Phosphorus, %	0.55	0.67	0.61	0.55	0.60	0.61

Note: Ground yellow corn may be replaced with ground milo.

Table 16. 14% complete G-F pig rations (for growing-finishing pigs from 75 to 225 lbs).

Percent protein	Ingredients	1	2	3	4	5	6
8.8	Ground yellow corn or grain sorghum	1616	1562	1610	1672	1178	-----
11.0	Ground barley	-----	-----	-----	-----	-----	1738
12.0	Ground oats	-----	-----	-----	-----	500	-----
44.0	Solvent Soybean meal	325	324	250	210	260	200
50.0	Meat and bone scrap	-----	-----	50	80	-----	-----
17.0	Dehydrated alfalfa meal	-----	50	50	-----	-----	-----
	Calcium carbonate (38% Ca.)	12	4	8	2	10	10
	Dicalcium Phosphate (26% Ca., 18% P.)	25	38	10	14	30	32
	Iodized salt	10	10	10	10	10	10
	Trace Mineral premix	2	2	2	2	2	2
	Vitamin premix***	10	10	10	10	10	10
	Antibiotics	+	+	+	+	+	+
	Total	2000	2000	2000	2000	2000	2000
Calculated Analysis:							
	Protein, %	14.26	14.53	14.26	14.13	14.07	13.97
	Fat, %	3.15	3.08	3.32	3.46	3.19	1.79
	Fiber, %	3.16	3.63	3.60	2.88	5.33	5.87
	Calcium, %	0.60	0.66	0.61	0.66	0.65	0.68
	Phosphorus, %	0.52	0.65	0.50	0.61	0.59	0.62

Note: Ground yellow corn may be replaced with ground milo.

Table 17. 12% complete G-F pig rations (for growing-finishing pigs from 125 lbs to market).

Percent protein	Ingredients	1	2	3	4	5
8.8	Ground yellow corn	1745	1684	1782	-----	1290
11.0	Ground barley	-----	-----	-----	1858	-----
12.0	Ground oats	-----	-----	-----	-----	500
44.0	Solvent soybean meal	200	210	100	80	150
50.0	Meat and bone scraps	-----	-----	80	-----	-----
17.0	Dehydrated alfalfa meal	-----	50	-----	-----	-----
	Calcium Carbonate (38% Ca.)	8	-----	-----	10	8
	Dicalcium phosphate (26% Ca., 18% P.)	25	34	16	30	30
	Iodized salt	10	10	10	10	10
	Trace mineral premix	2	2	2	2	2
	Vitamin premix***	10	10	10	10	10
	Antibiotics	+	+	+	+	+
	Total	2000	2000	2000	2000	2000
Calculated Analysis:						
	Protein, %	12.07	12.36	12.20	12.30	12.14
	Fat, %	3.36	3.14	3.79	1.82	3.39
	Fiber, %	2.89	3.31	2.63	5.76	5.12
	Calcium, %	0.55	0.52	0.63	0.63	0.63
	Phosphorus, %	0.50	0.59	0.69	0.55	0.59

Note: Ground yellow corn may be replaced with ground milo.

***Additional Information

Example of vitamin premix to be added to 1 ton of feed*

Ingredient	Concentration per 10 lb
Vitamin A	4,000,000 IU
Vitamin D	400,000 IU
Vitamin E	15,000 IU
Vitamin K	3.33 gm
Riboflavin	5 gm
Pantothenic acid	22.5 gm
Niacin	35 gm
Vitamin B_{12}	25 mg
Choline	100 gm
Carrier (such as ground corn)	To bring total to 10 lb

*This premix could be used at 10 lb/T for gestation, lactation, and starter diets and 6 lb/T for growing and finishing diets. To meet the recommended level of choline in the gestation ration, add 3 lb of choline chloride (25% choline) per ton of gestation ration.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the USDA. Hollis D. Hall, Director of Cooperative Extension Service, South Dakota State University, Brookings. Educational programs and materials offered without regard to age, race, color, religion, sex, handicap or national origin. An Equal Opportunity Employer.
File: 4.2-2—3M—7-83mb—ES 093.

Figuring Feeds for SWINE

FS 366
(Revised)

Cooperative Extension Service
South Dakota State University, Brookings
U. S. Department of Agriculture