SWINE PRODUCTION

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- The Pig and Poultry Development Project -Pig Sector, 10th Mile LDMC Farm, Prome Road, Ranggon

Japan International Cooperation Agency

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그리 교육화 우리 사람들이 하는 사람들은 현차를 가고했다. 있은 소작 작품이
연락하는 얼룩하는 돈 나는 얼마 하는 말을 하고 있는 것은 것은 것이다.
그 이 병 않을 위 병했다는 아시아 가는 중요한 경찰 수후에 가놓고 있었다는 가셨다면 살
그들이 한번 중에 대한 물이 그리고 있다는 그리고 있는데 된 이번 아무지 않아요. 하는 목이 없는데
이 아니들의 살고 있는 지수 않는 사람들이 아니는 그 사람들은 그는 얼룩하는 밤을 이 나를 하고 있다.
그의 등 아이들은 그릇은 나는 전에 가입으로 되는데 되었다는 것 같아요?
이 그들의 선생님 그 이 그들은 사람들의 학교회는 학생들이 되는 것이다. 그는 그리는 그리는 그리는 그리는 그리는 그리는 그리는 것이다.
는 보고 있는 사람들은 마음이 보지 않는데 보고 있다. 그는 사람들이 가르게 되는데 보고 있다.
1、 新电池 (A.) 新疆 (A.) 1、 " (A.) 新国 (A.) 和国 (A
en en altro france de forma de la composition de la forma de la composition de la composition de la compositio La composition de la



100 miles - 100	国際協力事	業団
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文字子 化电路化 化二氢乙酰胺 异体 计图记号电流 制造工作 计多数分离 医阿斯特斯氏病
人名马格尔 人名英格兰 医克尔特氏 医牙上皮 计算点 跨山 医皮肤 医肠神经上腺病 医电解管外外 医二
그는 얼마 그런 살이 말한다. 한 사는 사는 반대가 되었다. 본 사는 사람들은 사람들이 불다 되었다. 나는
하고 되는 사람들은 이번 사람이 있는 것이 하지만 하는 하고 있다. 이번 사람들은 그 전문적으로 함께 하는 것
그를 가득하는 사람들은 사이를 보고 가득하면 되었다. 경우 전 도입에서는 가득하고 있다는 눈빛이 함 못 되었다.
. 현실 경기 되었는 분실 회에 있는 기업을 보고 되었다면서 하는 것이 하는 동생이 되는 것이 하는 동생이고 불편한다면 함께 되는다. 하는 동생의 하는 생산이 되었다는 사람들을 보고 들었다면 되는 것이 되었다면 하는 모든 사람들이 되었다면 보다 되었다.
그 하는데 하는 그 사람에 된 대로 한 사람들들이 모든 것이 하는 보는 학생에 를 가입했다. 모습이 되었다.
선생님이 되는 그 그 그 그 그 그들이 되는 것도 하는 그들이 있는 그 그를 당했다. 그는 그 양반 그림은 하고 있는
그는 아이들 아이들 등을 지원하다 하나 이 이렇게 되었다. 그런 아이들에 살아 있다는 사람들은 아이들 때문에 되었다.
医三类菌 医二面前毛术 医无线管 医正正式 医多异核 计直接信仰 医肠切除的复数形式 经经营证券 医动脉丛
그 회사는 하는 일을 당한다고 하는 회에 들어 가장 한 가능은 그는 모모에 되어 가장 함께 보고 모양을 하셨다.
"不是我们的人,我们们是我们的,我们们的一个人,我们就是我们的人。" 化二氯甲基甲基苯甲基甲基二甲基
人名西西巴利西亚克 斯克斯马克克人 医其中主义 机木属性机造物 计可语识别法语 法人的 网络克莱尔
"是一点,我们一句,就是你说,我说话,"我说话,"这时间,这样"你就说话,""真就是这样的。"
어느 가는 그리 물이 물어가는 살아 나는 아무리 하는 그들은 그는 그를 모르는 것이 없는 것이다. 그렇게 다른 사람이 되었다.
"大""自己,大大","人"的"说"的"说","人"是"别"的"大大"的"一"。"说"是"一"的"自己"的"自己"的"说"。"我们"是"一"的"说"。"我们"是"一"的"一","我们"是"一","我们"是"一"。"我们"是"一","我们"是"一"。"我们"是"一","我们"是"一"。"我们"是"一","我们"是"一"。"我们"是"一","我们"是"一","我们"是"一"。"我们"是"一","我们"是"一"。"我们"是"一","我们"是"一"。"我们"是"一","我们"是"一"。"我们"是"一","我们"是"一","我们"是"一"。"我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一","我们"是"一",我们们"是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是"一",我们们就是我们们就是我们们就是我们们就是我们们就是我们们就是我们们就是我们们就
1、10、其类的创造,创造的量积分的创建。 赞多 副元氏 1、1、1、1、1、1、1、1、1、1、1、1、1、1、1、1、1、1、1、
그는 사람들은 학생들이 가득하는 학생들의 학생들의 등을 받았다. 회사를 가를 받을 수 있는 학생들이 없었다.
有一大大的 医多点 医多质性 经工程 化二苯基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲
그는 사람은 어느 과장된 어때는 이들은 무대에게 어떻게 하는 것이 되는 것을 하고 하는 것이다.
医大胆囊病 化二重 医牙侧侧 医性肠切除性 医抗性性 法国际 英格兰斯特 医克里特氏病 医克里特氏病
가는 보다는 것이 가지 않는데 하는데 하는데 하면 하다면 하는데
그는 회사회 등 이 중에 가는 뒤를 모르게 하고 있는 것 같습한다는 것들한 바람들을 하지만 하는다.
공하되는 사람들은 공급하는 사람들은 사람들의 전쟁을 들었다. 하는 사람들은 하는 사람들은 회에 가는 것은 것이다.
人名英国英英英英克 化二苯甲基甲基二苯二苯二苯二乙基甲基基氏虫 计多形式的 医克里耳氏征
그래 [[편리] 사이 유민물 아니는데, 그 그는 데 는 네덜란 문에 하는데 그는 다시 그를 되고 되는데 그
그림 문화 그렇게 다른 살이 되는 그가 하는 것들은 생활을 하고 있다. 유민들이 하는 것은 학생들이 있다.
医抗毒性溶液 建物 化氯化 医二甲二氏 计二元记录 建铁电影线 化冷凝 建转头柱 化二氯苯烷
그는 하늘 말할만 되었다. 그는 그는 눈으로 가는 그들은 그는 것으로 모든 그는 그들만 그림을 들었다. 그는 것은
"我们是这些时间,我们是你的意思,是这样的,我们也是一个人,我们是我的人,我就会有什么。""我们的
人名英格兰姓氏 医抗乳毒素 医二甲基甲基 人名马马斯 医皮肤 化二十二烷二十二烷基 医二氏管 医克莱特
"大学",本等企业,大学的创新的企业,包括各种的企业、企业、增强和企业的企业、企业、企业、企业、企业、企业、
그녀는 취약 그리는 사람들에 가장 하나를 가려고 한 것 하다는 사람들이 되었다면 그렇게 되었다.
人名雷克克 医复数感觉 医二氯化甲基二氯化甲基二甲基二甲基二甲基甲基二甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲
그는 그 가는 하지 않는 그는 이 가는 그 이 가는 그 같아 보는 집에 하는 하는 그 모든 나는 수 있었다. 그는 그는 그는
보는 경기에 가장 아니다 그 그는 말이 아이들은 하는 말을 하나 나는 것 같아. 이 말이 모든 말이
化抗压性 化克莱斯氏 医克里特氏 医二氯甲基 化二氯甲基二甲基二甲基二甲基甲基二甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基
医乳腺管 副制作 医二角 化多点管 计记载控制 医二甲二甲醇 英国共民共和国共和国共和国共和国
그 눈은 지금만 그리는 그들은 하는데 말하는데 반에를 하는 살이는데 되는 그림을 위한 그를 다
· 1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,1987年,198
可能,那一只要有点是一种的,只要一点一点,一点一点的感染,这一点的基本,这种一基础是一般,在1975年的。
海纳拉克 化阿维尼亚氏管 医电压性医院 化二氯化二氯化二氯酚 医心脏 医电影经历史 医电池
그게 가다가 가는 이 이 가는 사람들은 생활한 생활이 있는 것이 되었다. 그는 사람이 불가 된 것은 사람들이 되었다.
어느는 가는 사용 문에 되는 사회를 하셨다고 있다. 그리고 사용을 만든 하다 하는데 되는데 되었다.
化二重量 医乳腺管 美国人的 医二氏病 医大脑 斯马勒 医艾克氏管 医二氏管 经有量的 医克里氏病 医皮肤
가는 사람이 있습니다. 이 나는 이 이 동생님들이 가는 이 환경이 되는 것이 된 번호에 하는 것이다. 하는 것이다.
。 "你,你就是我们的我们的,我们就会看到我们的,我们也没有一个好话,我们就会会看到这个女子。"
우리 티트로 즐겁게 되는 사람들이 하지 않는 그렇게 되는 사람들이 되었다면 하는 것이 되었다. 그렇게 되었다.
アムドゥーとの関われるようにははたのが大力が大きによっていった。 はいしょう はいしょう
新,就没有一个人的说:"阿尔马克·斯特哈尔阿斯塔尔特,你们在这样的是特别,这是一个人的人们的。"
人名英巴拉拉斯 经工作的 医乳腺 化二氯甲基甲基酚基甲基酚 医克勒氏试验检尿病 化异子基酚 化自己混合物 化二氯甲基酚
그렇다는 보고 있다. 그는 그는 바다 함께 살아보고 되지 않는데 가지를 받는데 나를 하는데 없다.
그러는 문문에 그 이 씨는 어느 아이가 말통 그리가 하는데는 고양생은 하는데 모양이 되었다.
그 무슨 이 어느 되는 그림을 하는 그 얼마를 가장하는 것이 말을 받는 사는 중요는 모든 그를 먹어 가는 것이다.
그 회사는 문에 가능한 그들을 이 것이다. 시간 사람들이 되는 학생들은 그 사람들은 사람들이 들고 그를 보고 있다.
可克勒 医甲基内侧 英语 化二环 计磁塞 医电弧点螺旋的 海黄色 化二氯化二氯二酚 軍人
在一条,"你们才是这种,就是一个一个,是你只是你就能看了这个人就是我们的,我们就是一个一个一个一样。"
人名马德 医动物 医乳质 医动物量 的复数塞尔斯特美国美国共和国的医尔马特国的 电光谱 化二十二
法国人的 医克克氏病 化二甲基甲基二甲基乙酰 重新大型 医甲基甲基甲基甲基氏 医抗性 医大脑性 医大胆管 化二甲二甲二甲二甲甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲
计分类 医二甲基基基氏 医多二氏反射 医皮肤性 斯里克 美国意识的过去式和过去分词
engen er var en en en er en

CONTENTS

I.	BREED	S OF SWINE	1
		Origin and Characteristics of the Breeds	1
	2.	Hybrid Hogs	4
II.	PARTS	OF HOGS	7
	1.	Parts of Hogs	7
	2.	The Ideal Type and Conformation	7
III.	SWINE	BREEDING	8
	1.	Female Reproductive Organs	8
	2.	Male Reproductive Organs	9
īV,	NUTRI	ENTS REQUIREMENTS OF SWINE	13
٧.	NUTRI	TIONAL DEFICIENCIES IN SWINE	23
	1.	Deficiencies in Minerals	23
	2.	Deficiencies in Vitamins	24
	3.	Deficiencies in Protein	26
	4.	Deficiencies in Energy	27
VI.	SWINE	DISEASE GUIDE	29
VII.	BUILD	OING AND EQUIPMENT	53

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I. BREEDS OF SWINE

1. Origin and Characteristics of the Breeds

1) Berkshire

This English breed is one of the oldest breeds of swine.

Druing recent years the other breeds have been improved, and now several other breeds had longer carcasses and produced carcasses with less back fat.

The breed is black, with white marking usually on the feet, head, and tail; it has long been characterized by a short snout and a wide dished face.

Berkshires are slightly smaller at maturity than some of the other breeds. Mature boars weight 900 pounds or more.

2) Duroc

The ancestry of this breed is not entirely known, but the Jersey Reds of New Jersey, the red Durocs of New York, and the red Berkshires of Connecticut have contributed to the formation of the breed. The breed was first called the Duroc Jersey. Standards were established for the breed in 1885.

The Duroc is red in color, with the shades varying from a golden yellow to a very dark red. A medium cherry red is preferred. The breed is prolific, and the sows are good mothers. They have good dispositions and produce large quantities of milk.

The Duroc is large and has excellent feeding capacity. Most test related to rate of gain that have been made by agricultural experiment stations have indicated

that the Duroc is a very rapid gainer.

3) Hampshire

This breed was developed in Boone County, Kentucky from hogs probably imported from England in the early 1800's. The foundation stock, known as the Thin Rinds and Belted hogs, had been raised in the New England states.

The Hampshire is black hog with a white belt encircling the body and including the front legs. The back legs are usually black, and no white should appear above the hock. The head and tail are black, and the ears are elect. No white should show on the head.

4) Landrace

Landrace hogs originated in Denmark. The Landrace has white hair, and the skin is usually white. Small black spots, however are common. The breed is extremely long, deep sided, and well hammed. Usually the aminals are flat and sometimes low in the back. The ears are very large and cover much of the face. Many of the Landrace breed have weak pasterns. The breed is prolific and efficient in the use of feed.

Yorkshire

The Yorkshire was considered by many as the best bacon-type breed. The breed is raised in large numbers in Canada, England, Scotland, and Ireland. It is a native of northern England.

The Yorkshire is white in color but occasionally has black pigment spots in the skin. These spots are objectionable. The ears are erect. Mature boars weigh from 700 to 1000 pounds.

The Yorkshire is extremely long and deep, and is

firm fleshed.

Chester White, Poland China, Spots, Tamworth etc. are other established breeds of swine.

Table 1. Ranking of Breeds for Production and Carcass Traits

(WAJIMA)

			ثننسنج	 	
Breed	В	L	Y	H	D
Production traits					
Litter size	L	Н	H	Γ**	М
Birth weight	М	Н	М	H	Н×
Milking ability	L	Н	М*	М	M
Pigs weaned/litter	L	н	Н	L**	М
Daily gain	L	Н	М	M**	Н
Feed efficiency	L	Н	M	M**	Н
Soundness					
Vigor	Н	М	M**	M	Н
Feet and leg soundness	M**	L	M	М	м*
Carcass traits					
Back fat thickness	L	М	M⊁	Н	M**
Length	L	Н	H	M**	L**
Percent of ham	L	M**	L	Н	H
Lean cut percentage	L**	M**	М	Н	Н≭
Loin-eye area	H**	M×∗	М	Н	M**

H = High, M = Medium, L = Low

^{**} Higher level in the grade

^{*} Lower level in the grade

2. Hybrid Hogs

1) Hybrid defined

A hybrid is produced by crossing two or more inbred lines. Hybrid hogs are produced in much the same manner as is hybrid corn. Lines of hogs are inbred for several generations and then crosses are made of the inbred lines. The extent that the hybrid hog is more productive than the average of the parent stock is dependent upon the genetic make up of the various lines, and how well they supplement each other when they are brout together.

Heterosis

Heterosis

Figure 1. Heterosis

2) Hybrid vigor or heterosis

The crossing of two breeds of hogs has been a popular procedure in commercial hog production. The

Heterosis	

Crossbred	Two Breed Cross	Three Breed Cross AB x C
Item	A & B	7,10 A
No. of Pigs (Birth)		(+)
(8 wks)		(+)
Litter weight (8 wks)		(+) + +
Feed Conversion	<u>.+</u>	
Carcass Traits		

(+) Maternal heterosis

offspring usually make rapid and economical gains and have excellent constitutions. The crossbred gilts farrow and raise larger litters than do noncrossbred sows. This increase in vigor, growth rate and productiveness is called hybrid vigor or heterosis.

.	igure 2. Syst	ems of Crossbro	eeding	
Two Breed Cro	<u>88</u>			
Breed A	Breed, A	Breed A	Breed A	Breed A
x	×	X	x .	x
Breed B	Breed B	Breed B	Breed B	Breed B
Two Breed Rot	ational Cross			
Breed A	Breed B	Breed A	Breed B	Breed A
x	×	x	x	*
Breed B	Crossbred-	Crossbred-	Crossbred	Crossbred
Three Breed C	ross			
Breed A	Breed A	Breed A	Breed A	Breed A
x	×	x	\mathbf{x}	x
Crossbred(BC)	Crossbred(BC)	Crossbred(BC)	Crossbred(BC)	Crossbred(BC)
Three Breed R	otational Cros	<u>s</u>		
Breed A	Breed C	Breed B	Breed A	Breed C
x	x	x	x	x
Breed B	Crossbred-	Crossbred-	Crossbred —	Crossbred
Four Breed Cr	oss			
Crossbred(AB)	Crossbred(AB)	Crossbred(AB)	Crossbred(AB)	Crossbred(AB)
X	x	x	×	
Crossbred(CD)	Crossbred(CD)	Crossbred(CD)	Crossbred(CD)	Crossbred(CD)

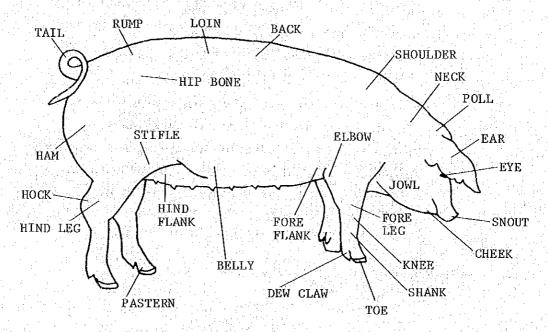
3) Hybrid hog production

- (1) Produce heterosis effects
- (2) The compensation of some deficiencies in each breeds.
- (3) Utilize of maternal or paternal effects.

1. Parts of Hogs

Farmers, breeders, and packers use much the same terms in describing hogs. Since these terms will be used repeatedly in the following paragraphs, the reader should become familier with them. Figure 3 shows the various parts of the body.

Figure 3. Parts of a Hog



2. The Ideal Type and Conformation

Breeders of pure breeds and commercial pork producers usually have some ideal in mind in selecting breeding and feeding stock. Usually they do not find animals that possess all the characteristics that they are looking for, and must select those that are nearest their ideal. Not all breeders and feeders agree as to what makes up the ideal type and conformation of a hog.

The ideal type changes from time to time with change in market demand.

III. SWINE BREEDING

1. Female Reproductive Organs

As shown in Figure 4, the reproductive system of the sow consists of the ovaries, the oviducts, the uterus, the vagina and valva.

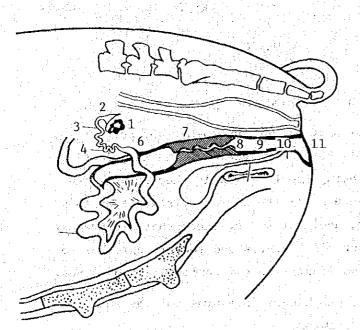
(1) Ovaries

These two glandular organs are located in the sublumbar region and produce the eggs. As the eggs mature, they are dropped into the oviduct. The process is called ovulation.

The heat period usually occurs every 21 days, but the interval may vary from 18 to 24 days.

Ovulation - the liberation of the eggs - usually occurs at about 31 hours (from 26 to 36 hours) of the heat period. Each follicle in the ovary contains

Figure 4. Reproductive Organs of a Sow



- 1. Ovaries
- 2. Fimbria
- 3. Ampulla
- 4. Isthmus
- 5. Uterine Horn
- 6. Uterine Body
- 7. Uterine Cervix
- 8. External Orifice of Uterus
- 9. Vagina
- 10. Vagnal Vestibule
- 11. Vulva

one egg. Gilts will produce from 10 to 15 and sows an average of 17 eggs during each period. Eggs can live for 5 or 6 hours.

Breeding should be timed so that the sperm is in the oviduct when ovulation occurs. It normally requires 15 hours to reach the ovum. It is thought that sperms can live in the female for 25 or 30 hours.

(2) Oviducts

These tubes lead from the ovaries to the horns of the uterus. The fertilization of the eggs usually takes place near the upper end of the oviduct. Several billion sperms are deposited by the boar in one service. Only one sperm can fertilize each egg.

(3) Uterus

The fertilized eggs move from the oviduct into the uterus and become attached to the wall. The fertilized eggs develop in the uterus.

(4) Vagina

The vagina connects the vulva and the cervix.

(5) Vulva

Both the urinary and reproductive organs of the female terminate in the vulva.

2. Male Reproductive Organs

(1) Testis

Sperm cells are produced in the two testicles, which are suspended in the scrotum.

(2) Deferent ducts

These tubes connect the testicles with the urethra.

Sperms pass through and may be stored at the upper end of these tubes.

(3) Seminal vesicles

These glands open to the urethra and secrete a fluid.

(4) Prostate

The prostate gland is located near the bladder and the urethra. It produces a secretion that becomes a part of the seminal fluid.

(5) Bulbourethral gland

These glands secrete a fluid that precedes the passage of the sperm cells down the urethra.

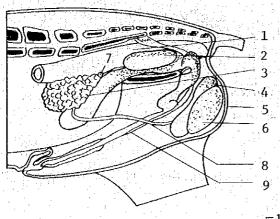
(6) Urethra

This long tube extends from the bladder to the penis and carries both urine and semen.

(7) Penis

This organ deposits the sperm cells within the female reproductive system.

Figure 5. Reproductive Organs of a Boar



- 1. Rectum
- 2. Bulbourethral Gland
- 3. Seminal Vesicle
- 4. Epididymis
- 5. Scrotom
- 6. Testis
- Prostate
- 8. Deferent Duct
- 9. Penis

Table 3. Farrowing Production Schedules

Breeding Dates	Farrowing Dates	Breeding Dates	Farrowin Dates														
Jan. 1	Apr. 24 25	Feb. 11 12	June 4 5	Mar. 24	July 15 16	May 4 5	Aug. 25	June 14 15	Oct, 5	July 25 26	Nov. 15	Sept. 4	Dec. 26 27	Oct. 15 16	Feb. 5	Nov. 25 26	Mar. 1
3 4	26 27	13 14	6 7	26 27	17 18	- 6 7	27 28	16 17	7 8	27 28	17 18	6 7	28 29	17 18	7 8	27 28	20
5	28 29	15 16	8 9	28 29	19 20	8 9	29 30	18 19	9 10	29 30	19 20	8 9	30 31	19 20	9 10	29 30	2 2
7 8 9	30 Mar. 1	17 18	10 11	30 31	21 22	10 11	31 Sept. 1	20 21	11 12	31 Aug. 1		10 11	Jan. 1 2	21 22	11 12	Dec. 1 2	2 2.
10 11	2 3 4	19 20 21	12 13 14	Apr. 1 2 3	23 24 25	12 13 14	2 3 4	22 23 24	13 14 15	2 3 4	23 24 25	12 13 14	3 4 5	23 24 25	13 14 15	3 4 5	2 2 2 2
12 13	5 6	22 23	15 16	4	26 27	15 15	5 6	25 26	16 17	5 6	26	15 16	6 7	26 27	16 17	6	2: 2: 3:
14 15		24 25	17 18	6 7	28 29	17 18	7 8	27 28	18 19	7 8	28 29	17 18	8 9	28 29	18 19	8	Apr.
16 17	9 10	26 27	19 20	8 9	30 31	19 20	9; 10	29 30	20 21	9 10	30 Dec. 1	19 20	10 11	30 31	20 21	10 11	
18 19 20	11 12 13	28 Mar. 1	21 22	10 11	Aug. 1 2	21 22	11 12	Jul. 1 2 3	22 23	11 12	3	21 22	12 13	Nov. 1	22 23	12 13	
20 21 22	15 14 15	3	23 24 25	12 13 14	3 4 5	23 24 25	13 14 15	4 5	24 25 26	13 14 15	4 5 6	23 24 25	14 15 16	3 4 5	24 25 26	14 15 16	
23 24	16 17	5	26 27	15 16	6 7	26 27	16 17	6	27 28	16 17	7 8	26 27	17 18	6. 7	27 27 28	17 17 18	10
25 26	18 19	7 8	28 29	1.7 18	8 9	28 29	18 19	8. 9	29 30	18 19	9 10	28 29	19 20	8 9	Mar. 1 2	19 20	1 1
27 28	20 21	.9 10	30 31	19 20	10 11	30 31	20 21	10 11	Nov. 1	20 21	11 12	30 Oct. 1	21 22	10 11	3 4	21 22	1.
29 30 31	22 23 24	11 12	July 1 2 3	21 22	12 13	June 1	22 23	12 13	3	22 23	13 14	2 3	23 24	12 13	5	23 24	1. 10
Feb. 1 2	24 25 26	13 14 15	3 4 5	23 24 25	14 15 16	3 4 5	24 25 26	14 15 16	5 6	24 25 26	15 16 17	5 6	25 26 27	14 15 16	7 8 9	25 26 27	1 1 1
3	27 28	16 17	6 7	26 27	17 18	6 7	27 28	17 18	7 8	27 28	18 19	7 8	28 29	17 18	10 11	28 29	20 2
5 6	29 30	18 19	8 9	28 29	19 20	8 9	29 30	19 20	9 10	29 30	20 21	9 10		19 20	12 13	30 31	2:
7 8	31 June 1	20 21	10 11	30 May 1	21 22	10 11	Oct. 1 2	21 22	11 12	31 Sept. 1	22 23	11 12	Feb. 1 2	21 22	14 15		
9 10	2 3	22 23	12 13	3	23 24	12 13	3 4	23 24	13 14	2	24 25	13 14	3 4	23 24	16 17		

IV. NUTRIENTS REQUIREMENTS OF SWINE

Breeding management practices and environment each affect requirements for specific nutrients, and specific physiological functions require different dietary requirements. For example, the pregnant sow's nutritional priority is for the developing

Table 4. Suggested Dietary Amino Acid Requirements and Protein and Energy Allowances for Swine

	Anima	1 Weight or	Phase of Pro	duction	
	Starter	Grower	Finisher	Bre	eder ¹⁾
	10 to 30 1b.	30 to 120 lb.	120 1b to mkt. wt.	Gesta- tion	Lacta- tion 2)
		(percent	of diet)		
Amino Acids ³⁾⁴⁾					
Lysine	1.00	0.74	0.60 ⁵⁾	0.42	0.60
Methionine 6)	0.60	0.50	0.30	0.28	0.36
Trytophan 7)	0.14	0.11	0.07	0.07	0.13
Arginine	0.37	0.25	0.15	_8)	0.34
Histidine	0.34	0.23	0.14	0.13	0.26
Isoleucine	0.76	0.52	0.35	0.37	0.64
Leucine	0.84	0.67	0.40	0.35	0.99
9 Phenylalanine) _{0.79}	0.54	0.32	0.33	1.00
Threonine	0.66	0.45	0.37	0.34	0.51
Valine	0.67	0.46	0.28	0.46	0.68
Protein 10)	20	16	14 ¹¹⁾	12 ¹²)	14
Energy, kcal/ lb. of diet dry matter			al gligadise Se sensi gligad Sel seesa gligad	e de Saletta Saletta (de Saletta (de S Orante (de Saletta (de Sa	
Digestible	1,680	1,670	1,670	1,650	1,670
Metabolizable	1,560	1,580	1,590	1,580	1,580

- 1) Amino acid requirements for the boar have not been determined. For maximum gain and efficiency, a boar should have about two percentage points more dietary protein than a barrow littermate. A diet adequate for the gestating gilt should be adequate for the mature boar.
- 2) A minimum of 28 days lactation is assumed.
- 3) The values here, unless otherwise indicated, were based on the dietary levels that produced maximum productive and reproductive efficiency.
- 4) Amino acid values for gestating and lactating animals are based on estimated and determined amino acid needs for maintenance plus either embryo development or milk production.
- 5) This amounts required for maximum (1) gain per unit of feed fed and (2) maximum lean tissue development. Maximum daily gain can be realized at a level of 0.52%.
- 6) Cystine can supply up to 56% of the need for suggested allowance for methionine. Thus, the values given here represent a methionine-plus-cystine allowance.
- 7) Biological activities for the growing pig of synthetic L-, DL- and D-tryptophan are 100,80 and 60%, respectively.
- 8) Recent research indicates dietary arginine is not essential for satisfactory reproduction.
- 9) Tyrosine can satisfy 30% of the values for phenylalanine.
- 10) These allowances were determined with use of fortified corn-soybean meal diets. Substitution of other grains for corn or other proteins for soybean meal should be made on amino acid basis.

- This is a minimum allowance for excellent meat-type herds.

 If barrows and gilts are fed separately, 13% and 15%,
 respectively, may more specifically satisfy the requirements
 since gilts produce leaner carcasses than do barrows.
- 12) Animals should be fed a minimum of one-half pound of protein per day.

to safeguard the reproduction of the species. In growing finishing swine, the requirements for maintenance must be satisfied before productive growth, expressed as increase in body weight, can be realized. It must be recognized, too, that biological availability of specific nutrients varies among feedstuffs, and, further processing and processing techniques can modify, either favorably or unfavorably, that availability. It is economically important that sources of nutrients and dietary formulation be combined to provide the best nutritional value at the least cost. Knowledge of the feeding value of different feedstuffs is essential if appropriate choices of ingredients and formulation are to be made. Energy for maintenance and weight increase can be supplied by carbohydrates, fat and protein (amino acids). In properly formulated diets, protein (amino acids) would not be used as an energy source, but the amino acids would be used in synthesis of body protein.

Lysine, methionine plus cystine, and tryptophan are the amino acids of primary consideration in swine diet formulation. If they are adequate, rarely would any other indispensable amino acid be in insufficient amount. Thus, in Table 4, these amino acids are listed first.

Table 5. Vitamin Allowances for Swine in Confinement

Animal Weight or Phase of Production

	Starter	Grower	Finisher	Breede	er ¹⁾
In diet	10 to 30 lb.	30 to 120 lb.	120 lb. to mkt. wt.	Gesta- tion	Lacta- tion
Fat Soluble					
Vitamin A I.U./lb 2)	1,500	1,500	1,500	2,500	1,500
Vitamin D 1.U./lb.	300	150	. 14	150	150
Vitamin E I.U./1b.3)	5	5	5	5	5 10
Vitamin K mg/1b, 4)	1		1 1	. 1	1
Water Soluble					
Riboflavin mg/lb.	1.5	1.0	0.8	1.0	1.0
Nicotinic acid mg/lb. 5)	12	8	6	8	8
Pantothenic aci mg/lb.	d 6	5	.	5.	5
Choline mg/lb.	600	400	350	400 ⁵)	400 ⁶)
Vitamin B^{12} mcg/ $1b$.	9	6	4	6	6

- 1) Vitamin levels adequate for the gestating gilt should be adequate for the mature boar.
- 2) It is suggested that in diet formulation corn not be credited for any vitamin A potency. This is based on the fact that (1) the carotene value can deteriorate with storage and (2) 1 mg of carotene may be equivalent to less

- than 500 I.U. vitamin A activity for the pig. The levels indicated here should be supplied in the vitamin supplement.
- These are not defined requirements, but are levels that have been used to alleviate apparent vitamin E deficiency symptons under field conditions. It is assumed that sufficient selenium (0.045 mg per lb. of diet) is present in the dietary ingredients.
- 4) Supplemental level.
- 5) The niacin content of corn, wheat and milo is considered essentially unavailable to the pig. Thus, the levels indicated here should be supplied by the vitamin supplement.
- 6) These values should be considered minimum. Precise requirements have not been determined.

The dietary crude protein levels indicated in Table 4 are based on corn-soybean meal or amino-acid-equivalent diets. mixture of corn and soybean meal for the protein percent indicated will provide adequate amounts of the essential amino acids for the weight of animal or phase of production indicated. tion of other grains for corn or other proteins for soybean meal must be done on an amino acid basis if amino acid deficiencies are to be avoided. The relationship of amino acids and energy becomes increasingly important as refinements of dietary requirements are realized. The digestible and metabolizable energy densities recommended in Table 4 are in keeping with present information. These values are on a dry matter basis since the dry matter content of mature corns is essentially of the same energy value, although moisture level of the corns may vary from 12% to 30%. It is to be noted, however, that improper drying, storage or processing of these grains can reduce their feeding

value. For example, roasting corn to temperatures (kernel temperature) above 150°C (300°F) can reduce biological availability of lysine.

Table 6. Mineral Allowances for Swine in Confinement

Animal Weight or Phase of Production

	7717	mar wergit	or thase of t	LOGUETON	,
	Starter	Grower	Finisher	Bree	der ¹⁾
	10 to 30 lb.	30 to 120 lb.	120 lb. to mgt. wt.	Gesta-	Lacta-
Calcium percent of diet	0.80	0.60	0.60	0.75	0.75
Phosphorus percent of diet	2)0.60	0.50	0.50	0.50	0.50
2)	0.50	0.50	0.35	0.50	0.50
Trace minerals	(for all ag	ges) ⁴⁾ mg	/lb. of diet -	or - ppn	1.
Iron 5)			32.0	70	
Copper			2.7	6	
Manganese			9.0	20	
Zinc			23.0	50	
Lodine			0.1	0.22	
Selenium			0.045	0.10	5)

Recent research data indicates these listed allowances are adequate for maximum rate of gain in growing boars. Higher levels, however, may be needed for maximum strength (as measured by weight required to break carcass, femur or metatarsal bones) of bone. Dietary levels of minerals adequate for gestating guilts should be adequate for sexually mature boars.

- 2) Availability to the pig of phosphorus from different supplements varies and should be taken into account.
- 3) Recent published information indicates that 0.25% dietary salt would satisfy the Na and Cl requirements for growing-finishing swine.
- 4) These are often provided by use of trace mineralized salt formulated specifically for use in swine diets.
- Iron in ferrous sulfate, ferrous fumerate and ferric ammonium citrate preparations is quite efficiently utilized. The availability of iron from various ferrous carbonates is variable, but usually very low. The iron inferrous or fer ferric oxide has essentially no nutritional value for swine.
- 6) Maximum allowable level in a mixed diet for swine. Added selenium must be in the form of sodium selenite or sodium selenate.

Table 7. Digestible and Metabolizable Energy Values for Certain Feedstuffs in Diets for Swine

Barley, ground 1,612 1	kcal/lb. of dry matter		
그 최근 회장 한 문화를 잃는데 하지만 하다 어떻게 한테 그는 그를 모습니	energy		
Corn, ground 1,684 1	, 498		
	,634		
Corn (Opaque-2), ground 1,700 1	,650		
Milo, ground 1,717 1	,634		
Oats, ground 1,372 1	,317		
Oats, rolled 1,918 1	,768		
Soybeans 2,016 1	,766		
Soybeans, extruded 1,960 1	,740		
Wheat, ground 1,735 1	,634		
Alfalfa meal 736	636		

kca1/lb. of dry matter			
Feedstuff	Dig. energy	Met. energy	
Dried skim milk	1,890	1,775	
Dried whey	1,750	1,544	
Wheat bran	1,234	1,135	
Wheat middings	1,575	1,516	
Wheat shorts	1,434	1,362	
Corn-gluten feed	1,384	1,190	
Distillers dried grains	915	822	
Distillers dried grains with solubles	1,370	1,230	
Torula yeast	1,555	1,507	
Cottonseed meal	1,388	1,180	
Fish meal			
Menhaden	1,661	1,362	
Herring	1,730	1,453	
White	1,600	1,360	
Meat and bone scraps	931	726	
Rapeseed meal	1,494	1,270	
Soybean meal			
49% crude protein	1,920	1,634	
44% crude protein	1,871	1,590	ម្នាក់
Tankage	1,234	1,000	
Molasses	1,490	1,390	
Peanut meal	1,584	1,443	
Rice bran	1,750	1,680	
Sesame meal	1,705	1,560	
Coconut oil	4,450		uedefikki Elimi D Samaan Tamban
Corn oil	3,460	3,340	
Lard	3,530	3,500	
Soybean oil	3,440	3,300	
Tallow	3,690	3,590	ARANZA TOTAL Politika

¹⁾ These values were selected on the basis of a compilation of results from several different determinations and estimates.

Table 8. Suggested Feeding Levels and Performance Criteria for Swine

Animal weight or production phase	Number of days	Average daily feed, 1b.1)	Average daily gain,lb.	Feed per 1b. of gain, lb.
20 to 45 lb.	23	1.85	1, 10	1.68
45 to 120 lb.	50	4.00	1,50	2.67
120 to 220 1b.	55	6.50	1.80	3.60
Gestation	sa Salah Palah Ariya			
Gilts	114	4.0 2)	0.90	
Sows	114	4.0 2)	0.60	
Lactation	21-42	$7.0-10.0^{3}$		
Boars 4)		er jakopitorija (j. 1864) 1818. gada – Jakobski		
Inactive		4.0- 5.0 ⁵⁾		
Breeding		5.0- 7.0 ⁵⁾		

- Corn-soybean meal, or equivalent, diets of about 90% dry matter and 1,500 kcal digestible energy/lb. are assumed.
- 2) This level usually adequate when animals are in a comfortable environment. Levels would need to be suitably adapted for different environments to ensure desired body weight gain.
- 2) Lactating sows need sufficient energy and nutrients to satisfy needs for body maintenance and milk production.

 Body size, length of lactation period and number of nursing pigs are primary factors affecting total need.
- 4) Diets nutritionally adequate for gestating gilts should be adequate for mature boars.
- 5) These levels minimize excess body weight and size.
 Environment and intensity of use affect total needs.

Vitamin (Table 5) and mineral (Table 6) allowances suggested here are believed to be adequate for swine raised in confinement. The energy values (Table 7) represent a compilation of available research data, with certain values representing averages for several different determinations or estimates from limited data available.

The information in Table 8 is intended as a guideline for evaluating feeding and performance of swine in confinement. If average performance of a herd does not meet these performance levels, the feeding and management practices should be critically evaluated. If average performance of a herd exceeds these guideline values, excellent nutrition and superior management are surely evident.

The values in the accompanying tables are based on available research information. For nutrients for which requirements have not been established, the allowances indicated represent estimates based on the limited information available. A minimal margin of safety is included to provide for variations (1) in management and environments and (2) in biological availability of certain nutrients in commonly used feedstuffs. These allowances, based on the use of corn-soybean meal, or equivalent, diets are believed to meet the needs of healthy swine in confinement. In some instances, individual values may be borderline or slightly deficient for diseased or stressed animals.

V. NUTRITIONAL DEFICIENCIES IN SWINE

1. Deficiencies in Minerals

(1) Calcium and phosphorus

Calcium and phosphorus promote bone formation and growth. The calcium and phosphorus levels pigs need for optimum daily gain and feed efficiency may not be the same as levels they need for normal bone formation. Retarded growth, lameness, stiffness, weak bones and poor reproductive performance indicate a calcium or phosphorus deficiency.

(2) Salt

Salt deficiency signs include slow growth and reduced appetite. Adding salt at 0.5 percent of the swine diet should correct salt deficiency. Salt deficiency usually doesn't occur unless produces restrict water.

(3) Iron

Iron deficiency is common in young pigs. Sometimes this deficiency causes scours in young pigs. Reduced growth rate, listlessness, wrinkled skin, thumps, scours and death also can occur. It is important that producers give newborn pigs supplemental iron, either in an injectable or oral form. Weaned pigs and breeding stock also need supplemental iron in their diets.

(4) Zinc

Slow growth, lameness, stiffness, diarrhea, dermatosis and parakeratosis can indicate a lack of zinc.

When calcium levels go above 0.8 percent of the diet and zinc levels are low, parakeratosis - a skin disease similar to dermatosis - may result.

(5) Manganese

Pigs deficient in manganese may have lameness, stiffness, weak bone structure, retarded skeletal growth and increased fat deposition. In addition, estrus may be irregular or delayed and new-born pigs may be weak.

(6) Copper

Pigs lacking copper may have anemia, leg joints that lack rigidity, hind legs that are extremely flexed and crooked front legs, as well as retarded growth.

(7) Iodine

Pigs deficient in iodine may grow slowly, show retarded food intake, poor hair coats and skin condition and develop goiters. Breeding and gestation are reduced. Pigs from females deficient in iodine during gestation may be hairless at birth and possibly stillborn.

(8) Selenium

Selenium deficiency is characterized by liver necrosis, a brownish-yellow discoloration of the fat, muscle tissue degeneration, edema and sudden death.

2. Deficiencies in Vitamins

(1) Vitamin A

Vitamin A deficiency may result in poor conception rates, pigs born weak or dead and boar sterility. Incoordination, paralysis, night blindness and total blindness also can indicate lack of vitamin A.

(2) Vitamin D

Vitamin D deficiency causes a disturbance of calciumphosphorus absorption and metabolism, reducing bone
calcification. In young, growing pigs it can cause
rickets. In mature animals a reduction of bone
mineral content causes some larger bones to fracture
spontaneously.

(3) Vitamin E

Vitamin E deficiency during gestation can increase chances of embryonic death, while lactating females may have pigs that lack coordination. Less use of pasture for pigs and more artificial grain drying has resulted in a lower vitamin E intake, leading to more deficiency symptoms occuring.

(4) Vitamin K

Usually, bacterial synthesis in the pig's intestine fulfills vitamin K requirements. However, sometimes pigs need more vitamin K than this synthesis provides. The deficiency is characterized by vascular fagility, lameness, hyperirritability, hemorrhaging and extended blood clotting time, blood tinged urine and death.

(5) Riboflavin

Slowed growth rate, immature, weak or dead offspring at birth and reduced reproductive performance characterize riboflavin deficiency. Reduced growth rate, lowered fertility, incoordination, stiffness and goosestepping reflect a pantothenic acid deficiency.

(6) Niacin

Because niacin is naturally bound in cereal grains, it is largely unavailable to the pig in corn, grain

sorghum and wheat. Signs of miacin deficiency include slow growth, some vomiting, diarrhea, dermatitis and hair loss. Sometimes the animal becomes spastic.

(7) Vitamin B12

Vitamin B12 deficiency reduces growth, lowers reproductive performance, and produces a rough hair coat and anemia.

3. Deficiences in Protein

Twenty-two amino acids occur naturally in protein. Of these, eight to ten are essential in swine for optimum growth, maintenance and reproduction. Lysine, threonine and tryptophan are the three most essential amino acids for swine. Pigs can get non-essential amino acids directly from the diet or manufacture them from nitrogen supplied in the diet.

A protein deficiency is caused by the lack of essential or non-essential amino acids in the diet. A dietary nitrogen deficiency also can prevent a pig from synthesizing non-essential amino acids.

A protein deficiency in baby pigs can reduce growth rate and feed consumption, while hindering muscular and body development. It also can produce a rough hair coat. This deficiency occurs most commonly when a sow is a poor milker and the baby pigs receive no supplementary feed.

Protein deficient growing-finishing pigs also suffer from reduced growth rate, lowered feed consumption, reduced muscular body development and a rough hair coat.

Gestating gilts and sows fed a protein deficient diet may show poor reproductive performance, farrowing small pigs and small litters.

Lactating sows fed a diet lacking protein may wean lighter weight pigs.

Pigs in any stage of reproduction should not be fed more protein than they can use. Over-supplying protein is both costly and wasteful.

4. Deficiencies in Energy

A baby pig can suffer energy deficiency when:

- ---its mother has too little milk or stops giving milk; the baby pig becomes chilled, causing the body to use energy to maintain warmth;
 - -- improper body metabolism exists;
 - --scours and dehydration occur;
- --the dam lacked energy during gestation. Consequently, the unborn pigs could not build up any energy reserve, making them small, weak pigs at birth.

No replacement equals a sow's colostrum. If the newborn pig doesn't get colostrum, he has less chance for survival. An orphan pig can get colostrum if he's placed with another sow that has just farrowed. If another sow isn't available, feed the orphan pig a milk replacer.

If growing-finishing pigs are fullfed normal diets, they shouldn't develop an energy deficiency. If an energy deficiency does exist, it will retard growth and reduce fat deposition.

Gilts and boars experiencing an energy deficiency can be delayed in reaching sexual maturity. In addition, gilts may not cycle regularly and boars may have decreased sex drive. However, it's important to keep replacement gilts and boars from becoming over-fat.

Insufficient energy in the diet, extreme cold weather

or disease can cause an energy deficiency during gestation.

Energy deficiency during gestation can cause fetal resorption, mummies, stillborns, small litters and small, weak pigs. It can lower conception rate and hinder cycling regularity in females and reduce breeding herd longevity.

Sows fed an energy deficient diet during lactation may decrease milk production or stop giving milk. Many swine producers put lactating sows on a full-feed diet five to seven days after farrowing. It's possible that a pig's genetic growth potential may exceed the milk produced by the dam. He may need supplemental feed during lactation.

VI. SWINE DISEASE GUIDE

This disease guide is a compilation in chart form of the more common disease and parasite conditions observed in swine. This information is generally available from many sources. Proper application of preventive measures are best programmed by a veterinarian as he establishes a herd health program for a given production unit. Due to the differences in management, facilities and a host of other factors, no one herd health program can encompass all of the needs of all producers.

The necessity for the prevention of diseases in swine herds is becoming increasingly important. With diseases such as pseudorables (Aujesky's disease), the introduction of carrier animals into the herd can start a costly disease outbreak for the pork producer. It is also important that the health history of the animals to be added to a herd be known and proper testing procedures be employed before bringing the animals to the production unit. Additionally, a strict isolation procedure should be developed before any new animals are added to the main herd. The veterinarian is the key individual in helping the producer to make knowledgeable decisions on the addition of animals to a herd. Adoption of a "closed herd" philosophy, or as nearly closed as possible, is very important in today's production enterprises.

Table 9. Swine Disease Guide

	Boars	
DISEASE/		Logical Section 1
CAUSE	PREVENTION	TREATMENT

Buy boars early from herds known to be free of disease. Isolate from the swine herd for 2-3 weeks. Prior to using the boars expose them to the females of the breeding unit 30 days before they are to be bred. This may be done by fence line contact. Have sufficient boar power, one boar for each 10 gilts to be bred in a three-week period. Use double mating. Since mating is a learned response, spend sufficient time with the new boars in trial mating to be sure they are capable of breeding.

Swine Erysipelas: Bacteria Erysipelothrix insidiosa	Erysipelas vaccine, (avirulent) 1)3) Erysipelas bacterin 1)3) Oral Erysipelas vaccine	Penicillin ²) Anti-swine Erysipelas serum ²) Oxytetracycline injected ²)
Leptospirosis Leptospira pomona grippotyphosa canicola	Leptospirosis bacterins use type according to strain of Leptospirosis diagnosed	Oxytetracycline injected ²) Streptomycin injected ²) To reduce chronis carrier state of Leptospirosis
icterohemor- rhagicae and other serotypes		Chlortetracycline 200g/ton continuous- ly or 400g/ton at least 14 days Oxytetracycline 500g/ton 7-14 days
Respiratory Infections Pneumonia Influenza Influenza virus Other viruses	Isolate new animals Avoid drafty conditions	Individual treat- ment ²) Penicillin, injected Oxytetracycline, injected

DISEASE/ CAUSE	PREVENTION	TREATMENT
Bacterial		Herd treatment ²⁾
infection Stress from environmental		Chlortetracycline or Oxytetracycline in drinking water
changes		Sulfathiazole in drinking water
		Tetracycline in drinking water
Arthritis and Lameness	Sort for good feet and legs, good	Dependent upon diagnosis ²)
(get proper diag- nosis)	conformation	Tylosin
Bacteria		Lincocin
Erysipelothrix insidiosa		Penicillin Anti-swine
Mycoplasma hyosynoviae (gallinarum)		Erysipelas serum
Injuries		
Foot pads Hoof wall cracks		
Brucellosis (Bang's Disease):	Buy from validated herds	None
Bacteria Brucella suis	Blood tests before adding animals to herd	

- 1) Available through your veterinarian.
- 2) Follow your veterinarian and the manufacturers' instructions.
- 3) Slaughter not permitted for at least 21 days after biological products have been injected.
- 4) Ideally the choice of antibiotics should be based on antibiotic sensitivity tests. Consult your veterinarian for details. -31-

5) Most of the drugs listed should be considered as aids in prevention and treatment of the disease. Combinations of several of these drugs are permitted. See Feed Additive Compendium for any recent changes.

Sows Pregestation

Brucellosis (Bang's Disease): Bacteria Brucella suis Leptospirosis: (See Boars) Vaccination 2-3 weeks prior to breeding 3) repeat at 6 month intervals Vaytetracycline 500 g/ton at least 14 days Oxytetracycline 500 g/ton, 7-14 days approximately one month before farrowing Oxytetracycline injected2) Erysipelas: (See Boars) Vaccination 2-3 weeks prior to breeding3) Respiratory Infections Pneumonia Influenza: (See Boars) Arthritis and Lameness: (See Boars) Buy tested animals None None Chlortetracycline 200 g/ton conti- nuously or 400 g/ton at least 14 days Oxytetracycline 500 g/ton, 7-14 days approximately one month before farrowing Oxytetracycline injected2) (See Boars) Sort breeding or shortly after breed- ing may produce a reproductive problem. (See Boars) Arthritis and Lameness: (See Boars)	DISEASE/ CAUSE	PREVENTION	TREATMENT
(See Boars) prior to breeding 3) repeat at 6 month intervals 400 g/ton at least 14 days Oxytetracycline 500 g/ton, 7-14 days approximately one month before farrowing Oxytetracycline injected2) Erysipelas: (See Boars) Weeks prior to breeding 3) Respiratory Influenza during or Influenza during or Influenza: (See Boars) Respiratory Influenza during or Influenza during or Influenza: (See Boars) Arthritis and Lameness: Sort breeding stock for good foot and lag conformation	(Bang's Disease): Bacteria	only or from validated herds and retest before adding to the	그 그 그 그는 그는 그를 가는 그는 그 생각이 되었다. 그는 이 생각으로 되었다.
(See Boars) Respiratory Influenza during or Infections Pneumonia Influenza: (See Boars) Arthritis and Lameness: weeks prior to breeding 3) Influenza during or shortly after breed- ing may produce a reproductive problem.		prior to breeding 3) repeat at 6 month	200 g/ton continuously or 400 g/ton at least 14 days Oxytetracycline 500 g/ton, 7-14 days approximately one month before farrowing Oxytetracycline
Infections shortly after breed- ing may produce a reproductive problem. (See Boars) Arthritis and Sort breeding stock Lameness: for good foot and		weeks prior to	(See Boars)
Arthritis and Sort breeding stock Lameness: for good foot and lag conformation	Infections Pneumonia	shortly after breed- ing may produce a	
Lameness: for good foot and	(See Boars)		
	Lameness:	for good foot and	

DISEASE/ CAUSE	PREVENTION	TREATMENT
Non-specific infections causing early	Co-mingle sows and gilts. Expose them to each other 30 days prior to breeding so	
embryonic death:	they will develop immunity to the bacteria	
Bacteria	and viruses that may be	present in the
Viruses	herd.	
		ta aradiahla far
	No preventive treatment	is available for
	viral infections.	
MMA Mastitis	Feed antibiotics ⁴⁾	Streptomycin injec
Metritis:	which sensitivity testing indicates	injected ²)
Bacteria	would be of value in	Cortico-steroids injected ²)
E. coli	your herd.	Injected
Streptococci sp.	Vaccination of the	
Corynebacterium and other bacteria	sow use mixed bacterins ³⁾	
Management factors	Autogenous bacterins prepared from bacteria	
Nutritional deficiencies	involved in the herd problem are best.	
Unknown causes	Use at 6 weeks and 2 weeks before farrow- ing (two injections)	
	Vitamin E 10,000 -	
	20,000 units/ton	
Agalactia:	Thyroprotein 100g/ton	Mineral oil by
Constipation	Oxytetracycline 50g/	mouth, enemas, Epsom or Glauber
	50g/ton Sole ration three	salts in feed or
	days prior to farrow-	water.
	ing and for first	e esperantistica e
	week of lactation.	
Mastitis		See above
Metritis		See above
Hormonal deficiencies		Posterior pituitary extract 1)

DISEASE/ CAUSE	PREVENTION	TREATMENT
	Caution: This drug will increase the metabolic rate. Sows and gilts will become very thin unless pigs are weaned early. Not recommended for routine use. Consult your veteri- narian.	
trophic Rhinitis: Bacterium Bordetella bronchiseptica Secondary invading	Nasal swabbing is a method to aid in the diagnosis and the control of this disease. Consult your veterinarian for details	None
bacteria	To reduce carrier state from sow to pigs, use 1 lb. of sodium sulfamethazine in 600 gal. of drinking water 3 weeks prior to farrowing (Many strains of Bordetella are resistant to sulfadrugs. Keep old sows in preference to gilts to reduce the amount of spread to pigs.)	
nfluenza Pneumonia: Influenza virus Pasteurella and other bacteria	Avoid bringing in new animals. Exposure to viruses, including influenza during gestation may affect the baby pig before birth.	Sulfathiazole ²) in drinking water. Individual treatment ²) Penicillin, injected ²) Oxytetracycline, injected ²) Tylosin, injected ²)

DISEASE/ CUASE	PREVENTION	TREATMENT
SMEDI Stillborn, Mummified pigs Embryonic death Infertility: Enteroviruses Influenza virus Pseudorabies virus Parvo virus Hog cholera virus and other viruses which may affect the unborn pig causing early embryonic death or mummification and stillborn or weak pigs at birth.	Co-mingle sows and gilts 30 days before breeding. Give fence line contact with new boars. Avoid exposure of pregnant animals to outside animals. Animals so affected usually will carry normal litters at the next breeding if not exposed to a different virus. This condition may recur in 2-3 years cycles on some farms.	None
Pseudorabies (Aujesky's disease) Virus, produces abortions, mummification of fetuses	Bring in blood test negative animals (SN).	None
Brucellosis:	(See Boars)	None
Bacteria Brucella suis Abortions		
TGE Transmissible Gastro-enteritis: Virus	Vaccination of the sow twice, 1),3) 6 weeks and 2 weeks prior to farrowing	None Avoid outside exposures during farrow- ing periods

DISEASE/ CAUSE	PREVENTION	TREATMENT
Clostridial enteritis Type C: Bacteria Clostridium perfringens Type C	Vaccination of the sow twice, 3) 6 weeks and 2 weeks prior to farrow- ing	This is a disease of the baby pig which may be prevented by sow vaccination. Schedule the second vaccination as near to 2 weeks prior to farrowing as possible.
Erysipelas: Bacteria Erysipelothrix insidiosa	(See Boars) Vaccination of sow ³⁾ can be done anytime during gestation, prefer before breeding to get maximum protection of sow.	May repeat vacci- nation 3-4 weeks prior to farrowing to help protect the baby pig (See Boars)
Leptospirosis: Bacteria Leptospira pomona, grip- potyphosa, canicola, icterohemmor- rhagicae and other serotypes	(See Boars) Vaccination of sow1)3) can be done anytime during gestation. Prefer before breeding to get maximum pro- tection. (Also see feed recommendations under Boars)	(See Boars)

- 1) Available through your veterinarian.
- 2) Follow your veterinarian and the manufacturers' instructions.
- Slaughter not permitted for at least 21 days after biological products have been injected.
- 4) Ideally the choice of antibiotics should be based on antibiotic sensitivity tests. Consult your veterinarian for details.

5) Most of the drugs listed should be considered as aids in prevention and treatment of the disease. Combinations of several of these drugs are permitted. See Feed Additive Compendium for any recent changes.

Arthritis and Lameness: (Get proper diagnosis)

Bacterium Mycoplasma hyosynoviae (gallinarum)

Erysipelothrix insidiosa Mineral deficiencies injuries

Foot pads and hoof wall cracks Good selection practices may be an aid.

Treatment based on diagnosis2)

Tylosin Lincocin

Penicillin

Anti-swine

Erysipelas serum

Cortico steroids

Baby Pigs

Hypodlycemia Sugar deficiency:

Starvation Chilling

Avoid chilling

Allow pigs to nurse shortly after birth (Don't keep the pigs away until the sow is through farrowing)

Dextrose or dark syrup by mouth or injected intraperitoneally as dextrose solution!)

Transmissible Gastro enteritis

TGE
Baby pig disease:
TGE virus

Avoid exposure. Limit people, animals, trucks on the premises. Don't bring it home from markets or your neighbors.

Sow vaccination (See Sows)

No treatment is of value. Normal electrolytes!) in water will help to replace the fluid loss in pigs. If they are over 2-3 weeks of age you may save a few more pigs.

Consult your veterinarian.

DISEASE/	PREVENTION	TREATMENT
CAUSE		
Clostridial	Sow vaccination3)	None
enteritis:	to protect baby pig	None
enteratio.	through colostrum.	
Bacteria	(See Sows)	
Clostridium		
perfringens	Clostridium Type C	
Type C	antitoxin at birth.	
	This may be too late	
	sow vaccination	
	preferred.	
Pseudorables		
(Aujesky's disease)		
Virus, produces	None	None
central nervous		
disturbances,	See Sows	
diarrhea,	Gestation/Farrowing	
vomiting,		
severe death		
losses.		
Non-specific	Before farrowing expose	Realy treetment
diarrheas:	the sow and gilt to	(First 24 hours
 Property of the second of the s	manure from the	most important)
E. coli and	farrowing house.	with an anti-
other	Bacterins to the sow	biotic or
	(preferably autogenous)	 Fig. 1. The state of the state
	may be helpful.	selected by using
		a sensitivity
	Sanitation of the	test4)
	building, wash and	
	fumigate. Wash the	Where the problem
	sow or gilt when brought to the farrow-	exists, treatment
	ing house. They may	at 24 hours whether
	be carriers. Allow	scours is ob- served or not is
	an interval between	a good practice.
		a good practice.
	farrowings. Consult	· 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.

Nutritional anemia:

Iron deficiency

Inject with injectable iron compounds at 1-3 days of age. Inject into the muscle of the neck or under the skin of the neck or flank. Give a second injection rations. if pigs are not starting to eat creep feed by 3 1/2 weeks of age. Oral iron dosed individually twice weekly until the pigs are eating will prevent anemia, but it is a time-consuming job. Oral iron in moss or feed is a valuable aid to prevent nutritional anemia.

Once anemia occurs use injectable iron compounds. Add additional iron and copper to the creep rations.

Pneumonia:

Bacteria
Pasteurella
Mycoplasma
Secondary to
Atrophic rhinitis

Drafts

Improve management, avoid drafts and chilling.

Bacterins (preferably autogenous) for Pasteurella pneumonia.

Oxytetracycline²⁾
Penicillin²⁾
Tylosin²⁾

These drugs are to be injected. Broad spectrum antibiotics oxytetracycline or chlortetracycline fed at high levels may be valuable in secondary chronic pneumonias.

Atrophic rhinitis:

Bacteria
Bordetella
bronchiseptica

Nasal swabbing of sows. (Consult your veterinarian about the merits and demerits of nasal swabbing.)

Rhinitis-free breeding stock.

Wean pigs early in infected herds.

Save older sows to raise replacement gilts.

Avoid stress conditions; enteritis, anemia, pneumonia and parasites which will make the effects of rhinitis more severe.

Keep cats and other carrier animals out of the farrowing house, as they Bordetella bron-chiseptica.
Bordetella bacterin injected at 7 and 28 days of age. Consider only as an aid. Maintain good preventive disease practices as well as good nutritional level.

Chlortetracycline 100 g/ton Sulfamethazine 100 g/ton Penicillin 50 g/ton

Chlortetracycline 100 g/ton Sulfathiazole 100 g/ton Penicillin 50 g/ton

Tylosin 100 g/ton Sulfamethazine 100 g/ton

Use for a minimum of 5 weeks, preferably to at least 75 lb. in weight. Many strains of bacteria are resistant to sulfa drugs. To control secondary pneumonias it may be necessary to use these products to market weight. Antibiotics may be injected for treatment of individuals showing respiratory problems. (See pneumonia, baby pigs)

Inclusion Body Rhinitis (IBR)

Virus, may be observed in conjunction with Bordetella bronchiseptica rhinitis

The effects of the disease may be quite severe in very young pigs.
Keeping older sows may be of value

None

DISEASE/ CAUSE	PREVENTION	TREATMENT
Arthritis	Clip needle teeth in	Oxytetracycline ²⁾
(Pyogenic):	first few hours, ear	2)
	notch and dock pigs in	Penicillin ²⁾
Bacteria	a clean and sanitary	Tylosin ²⁾
Streptococci sp	manner. Avoid rough	
Corynebacterium sp	floors. Mechanical	
Corynebacterrum sp	abrasions of the feet	
Staphylococci sp	and knees occurs in	
	first few hours of life.	
	Disinfection of navels	
	is important but other	
	sources of infection are	
	the ears, knees and tail	有头的 机多克二氏反应
	in modern swine units.	
	The use of epoxy paints	
	to improve the floor	
	surface may be helpful;	
	avoid excessively smooth	
	floors.	
Lameness:	(See above) Use a	Injectable anti-
	sanitary method to	biotics
Navel infection	reduce infection and	
Tail docking	control hemorrhage.	(See above)
Foot and leg	Chicken debeakers are	
abrasions	useful for this purpose	
Orbon deduction	as it cauterizes the	
Other injuries	tail stump.	
Bacterial	Avoid chilling and	Nitrafurazone or
enteritis:	drafts. Keep pens dry.	Tetracyclines
	Consider using creep	in pig's drinking
Bacteria	feeds with lower protein	water2)
E. coli most	levels that have addi-	
common Erratic	tional lysine and other	
diet sow's	fortification added.	
milk and creep	Use nitrafurazone or	
feed	sulfas in the drinking	
	water at weaning.	
Pigs immune	Carbadox in the feed	
system at low	may be of value. See	
point	note concerning the	
	use of carbadox under	
	Weanling Pigs and	
	Finishing Hogs	
	(Necrotic enteritis).	

Weanling Pigs and Finishing Hogs

Colibacillosis (Post weaning diarrhea)

Feeder pig enteritis

Non-specific bacterial enteritis:

Bacterial

Usually E. coli

Avoid stresses, feed changes. Medicate feed and/or water for 5-7 days during stress periods See Necrotic enteritis

Correct anemia if present

Use injectable iron and copper. Normal electrolytes may be of value in the water. Additional fortification with B vitamins in the diet may be helpful at this time.

- 1) Available through your veterinarian.
- 2) Follow your veterinarian and the manufacturers instructions.
- 3) Slaughter not permitted for at lease 1 days after biological products have been injected.
- 4) Ideally the choice of antibotics should be based on antibiotic sensitivity tests. Consult your veterinarian for details.
- 5) Most of the drugs listed should be considered as aids in prevention and treatment of the diseases. Combinations of several of these drugs are permitted. See feed Additive compendium for any recent changes.

DIESEASE/ CAUSE	PREVENTION	TREATMENT
Edema disease (Enterotoxemia): Bacteria E. Coli Stress such as weaning, shipping, feed changes	Avoid stresses, Use feeds with higher fiber content during this period	Starvation for 24 hours Nitrafurazone or Tetracyclines in pig's drinking water 2)
Parakeratosis: Zinc deficiency High calcium Rations or other minearl im- balances	50 ppm of zinc added to the ration	150 ppm of zinc added to the ration Check the amount of calcium in the ration
Hemorrhagic syndrome (Bleeding disease): Anti-vitamin K factors? Mycotoxins Moldy feeds Unknown causes	Menadione Sodium Bisulfite 2 g/ton of feed	Increased levels of Menadione Sodium Bisulfite in feed and/or water
Jowl abscess (Cervical abscesses): Bacterial Streptococci sp most common Many others also associated with abscess formation	Vaccination at 10-15 weeks of age ¹) ²) Chlortetracycline 50-100 g/ton to reduce incidence	Surgically drain abscesses (Limited value on a herd basis) Penicillin ²) conduct sensitivity tests of bacteria present to determine correct antibiotic ⁴)
Eryslpelas: Bacteria Erysipelothrix insidiosa	Erysipelas vaccine ¹⁾³⁾ (Avirulent) Erysipelas bacterin ³⁾ Oral Erysipelas vaccine	Penicillin ²) Anti-swine erysi- pelas serum ²)

DISEASE/ CAUSE	PREVENTION	TREATMENT
Necrotic enteritis Necro Bacterial enteritis	Bacitracin 50 - 100 g/ton of feed	Bacitracin Not less than 100 g/ton of feed
Bacteria Salmonella sp. May be present as a systemic disease with little or no diarrhea present. Contaminated feed sources Carrier animals Isolated new animals for 3-4 weeks before mixing with other swine	Chlortetracycline 50-100 g/ton of feed Furazolidone 150 g/ton of feed or Furazolidone 200 g/ton of feed, 2 weeks 150 g/ton of feed, 3 weeks 100 g/ton of feed, 5 weeks	Carbadox* 50 g/ton not to be fed to swine over 75 lb. Chlortetracycline 100-200 g/ton feed Furazolidone 300 g/ton of feed feed for 10-14 days
Swille		Neomycin sulfate 70-140 g/ton of feed
		Nitrafurazone 500 g/ton of feed 5-7 days water soluble form ²)
	Oxytetracycline 50 g/ton of feed	Oxytetracycline 100 g/ton of feed
		Penicillin-Strepto mycin combinations Maximum 90 g/ton of feed in combination.
		Sulfathiazole in drinking water ²)

At this time carbodox has not been cleared for use in combinations with sulfa drugs. If you need sulfa drugs to add in controlling rhinitis and pneumonia consult your veterinarian for proper application of these products in your herd.

DISEASE/ CAUSE	PREVENTION	TREATMENT
Hemorrhagic dysentery Vibrionic dysentery	Isolate new animals Avoid contaminated trucks and equipment	Carbadox 50 g/ton. Not to be fed to swine over 75 lb.
(Bloody scours): Vibrio coli Large spirochete Possible other unknown causes	Arsanilic acid or Sodium arsanilate 0.005-0.01 % 45-90 g/ton of feed	Arsanilic Acid or Sodium arsanilate 0.025-0.04% for 5-6 days 230-360 g/ton of feed
		Sodium Arsanilate ²⁾ Water soluble for drinking water
		3 Nitro-4 Hydroxy Phenyl Arsonic Acid ²) 0.02% feed for 5-6 days
	Furazolidone 150 g/ton of feed or Furazolidone 200 g/ton, 2 weeks 150 g/ton, 3 weeks 100 g/ton, 5 weeks	Furazolidone 300 g/ton Feed for 10-14 days
	Lincomycin hydro- chloride 40 g/ton	Lyncomycin hydro- chloride 100 g/ton for 3 weeks, then 40 g/ton
		Neomycin sulfate 70-140 g/ton of feed Nitrafurazone-
	Oxytetracycline 50 g/ton of feed	water soluble Oxytetracycline 100 g/ton
	Tylosin 100 g/ton of feed for 3 weeks, then 40 g/ton of feed to market weight	Tylosin 100 g/ton of feed for 2-6 weeks after treating with tylosin in drink- ing water for 3-10 days ²)

DISEASE/ CAUSE	PREVENTION	TREATMENT
	Virginiamycin Aid in the control, in swine up to 120 lb. 25 g/ton	Virginiamycin Treatment and control 100 g/ton 2 weeks followed by 50 g/ton
		Treatment in non-breeding swine over 120 lbs. 100 g/ton for 2 weeks.
Pneumonias: Secondary to Atrophic Hinitis	See Atrophic rhinitis baby pigs	Individual injected ²⁾ Oxytetracycline Penicillin
Secondary to	Early treatment	
Influenza	Avoid drafts	Herd ²)
Pasteurella sp.	Problem herds can use	Chlortetracycline Oxytetracycline
lycoplasma (VPP, SEP)	Pasteurella ³) bacterins	Sulfamethazine Sulfathiazole
	Avoid bringing in new animals; isolate all additions to the herd	Other sulfa drugs Expectorant drugs
Reduce migration of drug Ascarids are (Round Worms) makes the the pneumonia more severe Tylo	All of the above drugs for herd use are to be used in the drinking water.	
	Tylosin plus sulfa- methazine 100/100 (g/ton) in feed	
Atrophic	Avoid stresses.	Sulfathiazole or
rhinitis: See baby pigs		Sulfamethazine in drinking water
	Sulfamethazine, or sulfathlazole in the	管理技术系统 图象
	feed of small pigs,	
	use for at least 5 weeks, preferably to	
	75 lb. in weight.(Many	
	strains of Bordetella are resistant to sulfo-	
	namide therapy).	

DISEASE/ CAUSE PREVENTION	TREATMENT
Arthritis:	Tylosin ²)
Bacterial	Lincocin ²⁾
Mycoplasma hyosynoviae	Early treatment essential
(granularum) Erysipelas	Penicillin ²⁾
	Anti-swine ery- sipelas serum ²)

- 1) Available through your veterinarian.
- 2) Follow your veterinarian and the manufacturers' instructions.
- 3) Slaughter not permitted for at least 21 days after bio-oplogical products have been injected.
- 4) Ideally the choice of antibiotics should be based on antibiotic sensitivity tests. Consult your veterinarian for details.
- 5) Most of the drugs listed should be considered as aids in prevention and treatment of the disease. Combinations of several of these drugs are permitted. See Feed Additive Compendium for any recent changes.

DISEASE/ CAUSE	PREVENTION	TREATMENT
Tail biting: Tail biting Injuries Crowding	Remove tails on baby- pigs Well fortified rations Avoid crowding	Individual ²⁾ Penicillin Oxytetracycline Early treatment is essential
Dietary deficiencies		Herd Organic iodides ²) Magnesium oxide
Lack of enough feeders and waterers Lack of bedding (bare concrete floors)		in feed Hay, paper sacks, tires, bowling balls, to give hogs something to reduce bore-
Weather changes		dom. If closely confined move
Manure pit gases Unknown causes		pigs to a larger pen or outdoors.
Anemia: Nutritional (iron deficiencies		Acute hemorrhages as from ulcers and the effects of mold are seldom
Eperythrozoonosis (blood parasite)		observed early enough to justify treatment. Other
Moldy grains (blood loss from hemorrhages)		anemias are corrected by add- ing iron and
Gastric Ulcers (blood loss)		copper to the diet. Injected
Vitamin K deficiency or interferences with absorption and utilization		iron is used in conjunction with other post weaning diarrhea treatments.
Post weaning diarrhea (secondary effect		

Common Parasites - Internal

PARASITES/ PREVENTION TREATMENT CAUSE Ascarids Worm the sow prior to Sow breeding and/or 2 weeks Large round Dichlorovos. prior to farrowing. worm: 7-10 days prior Wash sow thoroughly to breeding and/ Ascaris suum before farrowing. or 2 weeks prior to farrowing. Raise pig in cleaned buildings or new hog Piperazine in pastures. Avoid old feed or water lots. same schedule as for Dichlorovos Pig Dichlorovos mixed in feed at 4-12 weeks of age. Piperazine compounds in feed or water 6 weeks of age or older. Levamisole: Hydrochloride in feed or water at weaning. Pigs Hygromycin B 12 g/ton of feed Thiabendazole 0.005 - 0.1%(45.4 - 908 g/ton)in feed. (administer continously, feed containing 0.05 -0.1 % for 2 weeks followed by feed containing 0.005 -0.02 % Thiabendazole for 8-14 weeks) Pyrantel Tartrate Pyrantel Tartrate

96 g/ton (0.0106%)

21-28 day feeding.

800 g/ton (0.0881%)

PARASITES/ CAUSE	PREVENTION	TREATMENT
Lungworms: Metastrongylus sp.	Raise pigs in confine- ment. Avoid ingestion of earth worms.	Levamisole Hydro- chloride in feed or water at weaning.
Whipworms: Trichuris sp.	General swine sanitation	Dichlorovos in feed as needed. Have your veterinarian check for the presence of parasites.
	Hygromycin B 12 g/ton	Hygromycin in feed. (An aid in treatment)
Nodular worm:	Hygromycin B 12 g/ton of feed	Hygromycin B in feed
Oesophogostomum sp.		Dichlorovos in feed Phenothiazine in feed
		Piperazine in feed or water
		Levamisole hydro- chloride in feed or water
	Pyrantel Tartrate 96 g/ton (0.0106%) 21-28 day feeding	Pyrantel tartrate 800 g/ton (0.0881%)
Strongyloides: Strongyloides ransomi:	Strict sanitation in the farrowing house. Maintain sows and gilts in clean dry pastures during gestation.	Thiabendazole Baby pigs 1-8 weeks of age 200 mg to each 5-7 lb. of body weight. Repeat in 5-7 days if neces-

CAUTION: In the use of products for mange and louse control, follow manufacturers instructions for proper mixing and application. Avoid medicated hog oils on pregnant animals as abortions may occur. It is not safe to spray small nursing pigs.

- 1) Available through your veterinarian.
- 2) Follow your veterinarian and the manufacturer's instructions.
- 3) Slaughter not permitted for at least 21 days after biological products have been injected.
- 4) Ideally the choice of antibiotics should be based on antibiotic sensitivity tests. Consult your veterinarian for details.
- 5) Most of the drugs listed should be considered as aids in prevention and treatment of the disease. Combination of several of these drugs are permitted. See Feed Additive Compendium for any recent changes.

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PREVENTION

TREATMENT

Thiabendazole in feed at a level of 0.05 -0.1 % has been reported to be of value.

Common Parasites - External

PARASITE/ CAUSE	PREVENTION	TREATMENT
Mange:	Dip or spray all new	Toxaphene
Sarcoptes scabiei	animals arriving at the farm. Routinely schedule spraying at	Malathion
Demodex phylloides	2 week intervals of	
	animals and premise	
	until control is achieved.	Coumaphos
		(Do not use on
	(교육한 20 일이 참으로 발하되었다. (전 경기 대한 20 20 20 20 20 20 20 20 20 20 20 20 20	pigs before weaning)
		Use above as a
Miller Market (1905) All Carrierto Carri La Galilla Carrier (1905) All Carrier	经分别的 建铁电弧电子 医甲基氏反应性神经炎 阿尔斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯斯	dip or spray
Lice:	Dip or spray all	Toxaphene
레. <u>은</u> 병적장 등에도 무슨다.	animals arriving at	
Hermatophinus	the farm. Routinely	Malathion
suis	schedule spraying at	Coumaphos
	2-3 week intervals	(Do not use on
	of animals and premise	pigs before
	until control is	weaning)
	achieved.	Use above as a
		dip or spray
		Crotoxyphos
		(Ciodrin)
		Fenthion
		(Tiguvon)
		Use above as a
		single appli-
		cation pour on
		the back line.

VII. BUILDING AND EQUIPMENT

The principles to construct the housing of hogs are:

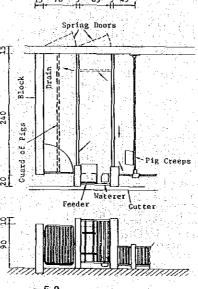
- Arrangement of pig houses. 1.
- 2. Arrangement and number of pen.
- 3. Width of pen.
- 4. Form of Roof.
- Material of floor and it's slope. 5.

Table 10. Standard Height of a Fence of a Pen

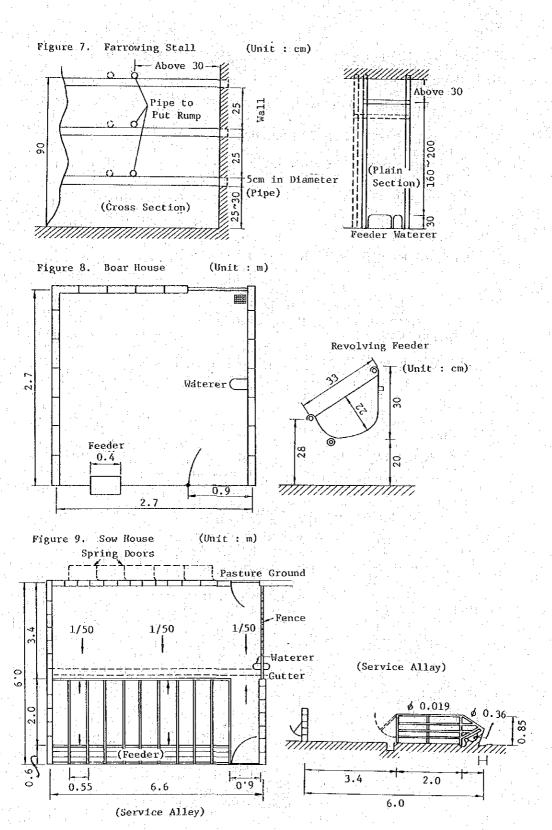
Type of Pen	Height	Interval
Farrowing Pen	90 cm	4 - 5 cm
Sow Pen	90	8 - 10
Boar Pen	110 - 120	8
Rearing Pen	85	6 - 7
Fattening Pen	85	7 - 8

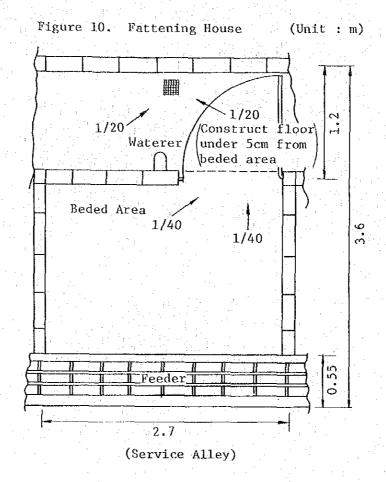
Figure 6. Farrowing Pen

(Unit : cm)



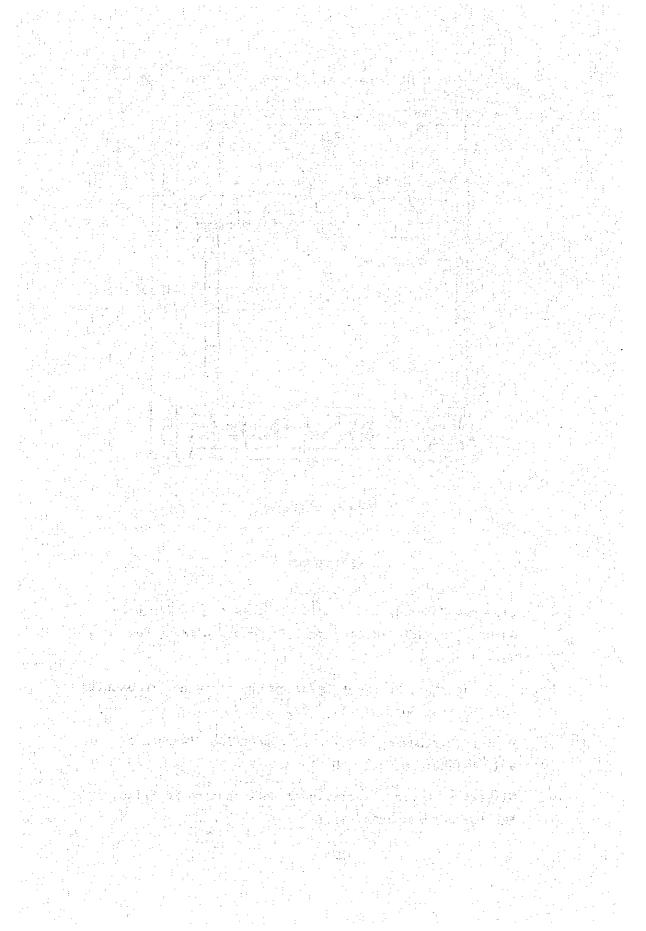
-53-





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 Vol. 49, No. 30, July 20, 1977.
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그 사람은 회복하게 심도움하게 끊이 되는 한다는 것이다. 그리다 그는 그리다는 그를 보는 그는 점에 걸리는 다른 사람이다.
그렇면 사람들이 고기가 되었다면 그렇게 내용되는데 그 나이가 하는데 가게 살을 내가 가는 것을 받는데 나
人名西西斯 法国际国际 看点糟的 的现在分词 医外侧丛科 人名英巴克斯特拉克 计能力制度
그 사회의 본의 생활에서는 12급한 원교는 중심 무대는 당실하는 것이 하는 그는 것이 되는 것 수 많은 사람들을 받는 것 같다.
그들도 있는 경기를 받는 것 같은 것이 되는 것이 없는 것이 없는 것이 없는 것이 없는 것이다.
그 왕 그리고 말한다는 그는 말을 하게 되고 하는데 되다. 그를 일벌하는 것만 되는데 그
그 병원는 기업 회장에 되었다. 그 이 보는 사람이 나는 그 생각이 없는 그렇게 보는 것이 얼마나 있다.
三字 医牙头的 网络人名 医乳腺 "你是这些我们,这事就是有特殊的,就是一样,我是一
그런 희롱 뭐야 하는 말이 되었다. 하나는 불자는 그들은 그 사회에서 되고 있는 것이다. 그는 사람들은 사람들이 다른 사람들이 되었다.
人名英格兰 萨雷斯森 化二氯化物 医大手 化二氯化物 化二氯化物 医二氯甲基酚 医二氯甲基二氯甲基二氯甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基
,我们就是一个大大的,我们就是一个大人的,我们就是一个大人的,我们就是一个大人的,我们就是一个大人的,我们就是一个大人的,我们就会一个大人的。""我们就是一个人 "我们就是我们就是我们就是一个人,我们就是我们就是我们的,我们就是我们的,我们就是我们的,我们就是我们的,我们就是我们的,我们就是我们的,我们就是我们的,我们就

人名马克因 电磁流分离流位 医二氏性缺陷 医肾虚功能 经金融的 医原性性的 化阿尔比曼电路 医阴壁管膜炎
그렇지만 되는데 본 점인 학교를 되는데 그 본산을 받아 되었다는 그렇다는데 말을 하네요. 많이 되는데 없는데
그는 장사 사람들은 경향을 하는 목숨이 살 한 시간에 당한 불병원 수 있다고 한다고 있는 것이다. 그 사람들이 사
그 다고 있는 것이 하는 사람이 가루고 있는데 이렇게 되고 있는데 어떻게 된 것이 한 것이 했습니다.
一名中国人 医克克耳氏性 医大脑性 医克洛克氏 医多克氏性 医二氏性 医二氏性 医电压性 医电压 医二氏性病
그는 사람이 보다 보면 함께 하는 사람들이 하지만 하고 있는데, 그들은 사람들이 하는 것이 되었다. 그렇게 되었다는데 그렇게 되었다면 하는데 되었다면 되었다면 하는데 되었다면 되었다면 되었다면 되었다면 되었다면 되었다면 되었다면 되었다면
三重 人名马德尔 医高温性多点 医动物 经收益的 医多二氏性 医二氏性 医动物 经自己 医二氏性炎 第二
그 그 그를 하는 것도 되는 한 일 모든 모두 불면 되는 점점이 되는데 있는데, 하는 동생은 생활을 받는데 가지 않는데 그 것이 없었다.
人名西德尼斯 电流通讯 医外骨髓 医动物性皮肤 医动物 化二氯甲基 的复数人名英格兰 网络电影 医电影 计电影 医皮肤炎
人名法巴特尔 化光点转换器 医圆瓣 医环境性动物 化阿里克斯克氏管外侧下孔反射 医重动性脑炎 医抗菌素
그들이 잘 가는 이번 회의 이 것들이 살 것들이 가득했다. 그 등록 하는 마음은 사람이 되는 것 같아 되는 것 같아. 하는데 회사 회사 기계 회사를 받는 것이다.
그는 도시기 어때로 가게 잘 그가 그릇을 받아 살았다. 그 문제들을 그리는 얼룩 들어 가는 것이다고 있는 글로 먹었다.
그 문화 원하하다 학생님 그 외울 대학 사이들을 동생하다 불점심 소전하셨다는 이 하였다. 문화가 그림을 나는
그렇게 되면 한 것이 그 문항인 일본 사람들은 학교학교는 일본 회사를 받는 사람들은 사람들은 경기를 받는 것이다.
그 본 그 분들도 되골 이 학생님들이 그는 그 수요한 생각을 하는 사람이 되었다. 그리고 이 그리고 살아 없는 것이다.
그 축구는 그리고 경영 그는 선생님들이 생각하는 생활이 생각하면 하는 것 같은 눈이 있는 것이 되었다.
人名英阿萨 医克勒氏试验 医动脉关节 医皮膜 计自由计划设置 医二甲酚磺胺基 化连续量的 医多种毒物
1996年,建筑1000年的 1996年,北京日本 1996年,1996年,1996年,1996年,1996年,1996年,1996年,1996年,1996年,1996年,1996年,1996年,1996年,1996年,
人名英格兰姓氏 建二十分 医肾髓 化氯化二甲酚 网络拉拉克森森拉拉拉 电超级性的 医孔线电影 医阴管脑室 化二基苯
。 1、1、1、1、1、1、1、1、1、1、1、1、1、1、1、1、1、1、1、
그들이 이 전에 대한민국은 사람들은 아내는 경소 사람들을 하는 사람들은 전쟁을 위한 관리를 가지 않는 것 같습니다.
그 보고 있다. 그는 일반한 한 다른 본 전 하루 하다 하는 수 있는 사람들이 되었다. 그는 사람들은 하는 사람들이 되었다. 그는 사람들이 되었다.
人名西德 的复数形式 医二甲基二酚 医巨性阴茎 医动物性皮肤的 医枕边 轉數 医小线点性囊炎 网络鼻髓 化二
그는 사람들은 그는 것 같은 그를 한 분들이 들출한 물건으로 하고 한 그 그런 한글 장안에 가는 등 하루를 구고한 분야.
그렇는 한 것 하는 것이 있는 말 하는 그는 경우 많아 되는 것이 되는 것 같아. 그런 그를 가지 않는 것이 없는 것 같아.
人名西西克 医二氏性皮肤 医乳皮 医乳皮管 医乳皮管 医皮肤 医乳皮管 医皮肤 医皮肤 医二氏虫虫
1996年,1986年,1986年,1986年,1986年,1986年,1986年,1986年,1986年,1986年,1986年,1986年,1986年,1986年,1986年,1986年,1986年,1986年,1
人物经验 医动物 医重点的 医罗斯特 起点 医动脉增殖性 医乳粉 电二流管 重压电池 医乳质结合管系统管管
人名西西利利 化氯化二甲基 化氯苯基 医乳腺管 医结膜 人名英克勒 经总额 电电路电路 经营业的 经
一种"自己","自己",两个年代,"你是是自己的是不知道。""我们,这个这是是不是这样。""不是这样的自己。"
人名巴萨尔 医马克里 法国际 医二氏性神经神经神经神经神经神经神经神经神经神经神经神经神经神经神经神经神经神经神经
。 · 无法 * 1、 * * * * * * * * * * * * * * * * *
그 선생님 보고학과 그를 되는 것으로 가고 있다고 함께 되는 것은 것은 사람들은 것으로 살아가 되는 것으로 살아왔다.
人名西德雷克 医二氯甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基
그 한다는 어느 어느 어느 나는 나는 아내는 아내는 아내는 아내는 아내는 아내는 아내는 아내는 것이 없다는 것이다.
그는 집에 되고 그 생활에 한 문에 모양이 되었다. 하고 생활하는 한 생활을 하는 것이 되었다. 그는 것이 없는데 다른
。 "你一点,一点,我说话话说,一点一点,我想到我们的,我就是我们看到一看的。""我们就会说,我没有事情,我们
그런데 그렇지 않는 현실 및 회사는 이 이 수 보는 팀에 하게 되는 것 같은 이 회장 회장에 되었다. 교육 본 등 이 기
그는 그는 그 살림이 그 걸고 가고 있다. 한 한 학생들은 학생들은 그들은 학생들은 학생들은 학생들은 학생들은 학생들은 학생들은 학생들은 학생
人名英国人姓氏克萨 医乳腺管 医骶线性 医髓性肾盂内 医多侧性 医多种性 电电阻 医多种 医二氏病 化对邻苯甲基酚二甲
。
그는 사람들 모임 사람들은 사람들에게 하는 한 유교하고 있었다. 하는 그 하는 사람들은 것 같아요?
그는 그 사람들은 학자에는 근 별이번 하지만 하지만 하다 가는 비용한다며 된 하지만 원들이 참 본 문이다.
그는 그 회사 가장 원리 한 것이 되는 것이 가득하는 것이 하는 것이 없는 그 것은 학생들은 생각을 가지 않는 것이 되었다.
사람들은 고기들은 할 때 그 학교를 받는 것이 수 없었다. 집 이 회장에 가장되었다. 전투성이 되어 있는 것 않는데 그 없다.
"我们的大大,我们是在我们是是我们的特别,我把我们的的身体的人,这是这种的对象的是是我的,是我们是这样的。"
,一个个文化,是一个人的,一个大概是一个特别的一个大概,这样是这些多数的,更是一个对话的。 (1) A.S.
。"""秦","我们的人,我们是我们的一种,我们的一个人,我们就是这个人,我们就是这个人,我们就不是这个人。""
化二氯化甲基酚 医多种性 医二氏性 医克里特氏 医二氏性 医二甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基

경제 교회에 가지 되면 보고 있어요. 그리고 발표를 통해 되었습니다. 그는 그는 그 가장에 그는 것 같습니다.
나는 아무리는 이 일반으로 하고 하다를 받으면 살아 보는 것이 되었다. 그들은 이 기반에 되는 날았다.
등을 보는데 우리 하는 다음이 이렇게 불었다. 이번 이름 등 이 가는 이름도 이미로 한 말을 높는
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