PennState Extension

AGRICULTURAL ALTERNATIVES

Swine Production

While the trend in the swine industry continues toward larger farms, opportunities remain to make money by raising hogs in a part-time enterprise. Approximately 80 percent of Pennsylvania swine operations produce fewer than 100 head per year, and only 1 percent produce more than 1,000 head per year.

Technological change and vertical integration in the swine industry have resulted in fewer farms producing record amounts of pork. Currently, there are around 8,000 Northeast pork producers, who sell almost 1.3 million pigs valued at more than $500 million annually.

Marketing

You need to consider what marketing strategy you would like to pursue before beginning a swine production enterprise. The alternatives for marketing feeder pigs and slaughter hogs from small-scale or part-time farms include:

- Sale of feeder pigs to finishing pig producers
- Livestock auctions
- Graded feeder pig sales
- Slaughter hog sales to packer buying stations
- Direct sales to major packing plants
- Small packers/processors
- Specialty sales direct to consumers

Feeder Pig Marketing

All of these marketing options are available to feeder pig producers. One of the most popular options is marketing directly to producers who finish pigs. This option has advantages for both parties. First, the buyer and seller know the price and delivery conditions in advance. Second, the direct-sale option reduces animal stress and disease risk. Third, the direct-to-finisher transaction voids commissions associated with a livestock auction.

Marketing feeder pigs through a livestock auction, graded sale, or buying station is another common option. Before using these markets, you should know the desirable weights and lot sizes that garner the highest price.

Slaughter Hog Marketing

Buying stations and direct sales to a major packer are popular options for marketing slaughter hogs. In both cases, producers are quoted a price before the sale is finalized.

Small packers and processors are an additional market available to slaughter hog producers. They often pay a good price, but their plant capacity and number of customers restrict the number of hogs they buy.

An auction barn is another option for selling slaughter hogs. Producers often use this market because of its location and convenience. The disadvantage of marketing through an auction barn is that producers are at the mercy of the supply and demand for hogs at the local market on that day. Prices may be well below or well above the national price on any given day and the producer must take the highest bid price. Auction barns also charge a commission regardless of the final bid price.

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Specialty markets represent another alternative for slaughter hog producers. A popular form of direct sale enables the consumer to buy directly from a producer. The consumer then contracts with a small packer for customized meat cutting and packaging.

In summary, choosing a market involves doing your homework. When comparing market alternatives, you must account for differences in price received, transportation expenses, shrink losses, selling costs, and convenience. A market 50 miles farther from the farm that offers a higher price may in fact produce less net revenue than selling locally at a lower price when all marketing costs are included. You must know your alternatives and stay current with price trends and market preferences.

Three Enterprises and Characteristics

Three types of swine production enterprises are farrow-to-finish, farrow-to-feeder, and feeder-to-finish. No single blueprint exists for these systems. Designing a production system that will complement your resources and lifestyle is the most important component to determining the best production system for you.

To determine which enterprise will work best in your situation, you must first consider the following:

- Amount of capital, labor, and land available
- Level of management and marketing skill needed
- Social and environmental implications associated with manure management

Farrow-to-Finish

A farrow-to-finish enterprise involves breeding and farrowing sows, and feeding the offspring until they reach a market weight of about 280 pounds. The entire production period takes approximately 10 months, with 4 months for breeding and gestation and 6 months to raise the litter to market weight. Of the three systems, farrow-to-finish has the greatest long-run market potential and flexibility. This system also demands the most capital and labor, and requires a long-term commitment to the swine business. A small number of sows can fit into a crop operation nicely when farrowings are scheduled to avoid peak harvest times. With the current focus on animal welfare, most new farrow-to-finish operations are designed to hold gestating sows in pens rather than crates, which may increase the capital required for sow housing.

Farrow-to-Feeder

A farrow-to-feeder enterprise involves breeding and farrowing sows and then selling the piglets to finishing operations when they weigh 30 to 60 pounds. Compared to a farrow-to-finish operation, this option decreases the need for facilities, operating capital, and the amount of feed and manure handled. It also provides a good foundation for increasing the number of sows or expanding into a farrow-to-finish operation. The biggest drawback of this system is that producers, especially those with small herds, are at the mercy of a volatile feeder pig market. This may require farrowing sows in groups to increase the number of pigs available during periods of high demand.

Feeder-to-Finish

Most feeder-to-finish enterprises buy feeder pigs weighing 30 to 60 pounds and feed them to market weight. In many cases, existing facilities are adequate for this system. This system allows for minimum overhead, low labor requirements, and no long-term commitment. The feeder-to-finish operation offers an opportunity for a grain farmer to use homegrown feeds to finish pigs without having to manage breeding stock. The operation also may capitalize on the fertilizer value of the manure. Important points of concern are the source, health, and quality of purchased feeder pigs. Ideally, all feeder pigs should originate from a single farm to reduce potential herd health problems.

Feeding

Feed is the major expense of any swine production system. In general, a farrow-to-finish operation will spend 75 percent of its total expenses on feed, compared to 50 percent for farrow-to-feeder operations, and 65 percent for feeder-to-finish operations.

Example swine diets are presented in Table 1, but they will vary depending on your management program, feed quality, and the condition of the animals. A summary of production inputs and manure output for different types of swine enterprise is listed in Table 2.

Growing your own grain, making bulk purchases of additional ingredients, and using your own grinder and mixer (or hiring the work done in some situations) are effective ways to lower feed costs. However, adequate storage for large quantities of feed ingredients is necessary.

One major consideration in planning a swine enterprise is how to get feed to the pigs. Ideally, animals in farrowing, gestation, and nursery units should be hand-fed and those in the growing-finishing units could get their feed from automatic augers.

Watering

Quality of the water source is a very important health consideration in swine production. City or well water is preferred. Caution must be used when using spring water due to surface contaminants that can lead to health problems. Pond water should be avoided.

Getting water to the pigs is generally simple. Water lines running into the barn should be buried or properly insulated to prevent winter freezing. Automatic nipple waterers are best when set at proper flow rates. Bowl-type waterers are acceptable, but they are difficult to keep clean and often

Table 1. Example swine diets for various stages of swine production.

	PHASE (QUANTITIES LISTED ARE POUNDS PER PHASE PER SOW)				
	NURSERY/STARTER	GROWER	FINISHER	GESTATION	LACTATION
Corn	1,400	1,500	1,600	1,200	1,500
Soybean meal	550	450	350	250	450
Oats	—	—	—	500	—
Minerals	50	50	50	60	50
Totals	2,000	2,000	2,000	2,000	2,000

Table 2. Expected weekly feed, labor, water, and manure management requirements for different types of swine enterprises.

ITEM	FARROW-TO-FINISH (20 SOWS)	FARROW-TO-FEEDER (20 SOWS)	FEEDER-TO-FINISH (100 HOGS)
Feed (pounds/week)	5,800	1,200	4,500
Feed ($/week)*	385	120	265
Labor (hour/week)	16	11	5
Water (gallons/week)	2,100	700	1,400
Manure output (cubic feet/week)	370	100	160
Manure output (gallons/week)	2,000	725	1,200

*Feed cost can vary tremendously depending on local and national grain markets.

Table 3. Water requirements for swine by size of animal.

ITEM	SIZE OF ANIMAL				SOW AND BOAR	LACTATING SOW
	12–30 POUNDS	30–75 POUNDS	75–100 POUNDS	100–240 POUNDS		
Intake (quarts/day/head)	1	2	5	6	8	10

lead to water wastage. Remember that all the water put into the building must eventually be hauled out as waste. Water requirements for swine are provided in Table 3.

Manure Handling

Waste management often requires more labor than most part-time producers anticipate. How you get the manure out of the pens, out of the buildings, and onto the fields must be thoroughly planned before bringing any number of pigs onto your property. When handling manure, be considerate of your neighbors and be sure your practices comply with local, state, and federal guidelines and regulations. The expected quantities of manure from each of the three production systems are listed above in Table 2.

Bedding

The need for bedding will depend on the facility. The use of straw in a cold, drafty barn will minimize the need for an elaborate ventilation system, but it will require more labor. Shavings may be used, but they can be quite costly. Sawdust should be avoided because of the potential for transmission of swine tuberculosis.

Health

Most part-time swine producers have minimal problems with herd health. Some important aspects of maintaining herd health include:

- Purchasing breeding stock or feeder pigs from a disease-free source
- Keeping the facilities clean and maintaining adequate ventilation
- Establishing a herd health program (in conjunction with a veterinarian)
- Avoiding visits to other swine farms to reduce the risk of disease transfer

The elements of a herd health plan usually include provisions for:

- Reducing the risk of new disease introduced by herd additions or visitors
- Maintaining sanitation
- Treating or avoiding parasites
- Preventing and controlling respiratory, reproductive, and diarrheal diseases

If these guidelines are followed, most herd health problems

can be avoided and they should require only a small investment in time and money.

Pastured Pork Production

In recent years there has been increasing interest among small-scale hog producers in using pasture as a feed source. Hogs can utilize pasture, but not as efficiently as ruminants. Research has shown that fiber digestibility improves as the hog matures. Ideally, pasture needs to be used at an early stage of maturity while the energy content is at its highest and fiber is at its lowest. There are both advantages and disadvantages associated with using pasture for hogs.

Advantages:
- Outdoor, pasture-oriented production systems open up potential niche market opportunities.
- Hogs can benefit from the activity and exercise associated with foraging.

Disadvantages:
- Excessive rooting behavior can result in soil erosion issues.
- Hogs can escape from pastures. Hogs escaping from farms has been identified as one of the causes of the growing feral hog problem in many parts of the United States.
- Internal parasite issues can be severe on poorly managed pasture systems.
- Light-skinned hogs can suffer sunburn while grazing.
- Managing pasture takes much time and commitment to make it successful.

Feeding Hogs on Pasture

If you decide to use pasture on your farm, you need to be committed to managing the pasture plants and grazing. Pastures can be made up of either perennial or annual plants. A perennial pasture is a long-term investment. It is important to try to prevent rooting damage to perennial pastures to maintain their long-term productivity. Annual pastures will need to be replanted each year. Tillage used to establish annuals can also be used to smooth out fields and reduce bacterial and parasite contamination. Reestablishment adds considerable cost to the use of pasture.

Perennial Pasture Plant Species

Perennial legumes that were commonly used for hog pasture in the past include alfalfa, red clover, ladino white clover, alsike clover, and birdsfoot trefoil. The following are common perennial grass species that can be used for pasture: orchardgrass, Kentucky bluegrass, smooth bromegrass, timothy, and perennial ryegrass. Consult the *Penn State Agronomy Guide* (**extension.psu.edu/agronomy-guide**) for more information concerning pasture maintenance.

Annual Pasture Plant Species

Common annual plant species that can be used for hogs include rapeseed, oats, wheat, barley, rye, triticale, sudangrass, annual ryegrass, crimson clover, and soybean. Field corn was once commonly used as a "hog down" crop. This involved allowing the corn to mature and produce an ear of grain. Hogs were then turned into the field during the fall months to harvest the standing corn.

Stocking Rates

Stocking rates depend largely on soil types, the plant species being grazed, and weather conditions. Producers can normally stock gestating sows at 4 to 6 sows per acre and growing hogs at 10 to 12 hogs per acre. Sows need to be fed 2 to 3 pounds of complete feed daily while on pasture. Growing hogs should have access to complete feed at all times while grazing. A complete feed typically consists of corn and soybean meal and is balanced for all nutritional needs of the class of hogs being fed. It can be used as the sole source of feed. Having a balanced ration available will also reduce rooting behavior.

Environmental Regulations

All agricultural operations in Pennsylvania, including small-scale and part-time farming enterprises, operate under the Pennsylvania Clean Streams Law. A specific part of this law is the Nutrient Management Act. Portions of the act will pertain to your operation if you are planning swine production on your farm. All operations are a potential source of surface water or groundwater pollution. Because of this possibility, you should contact your local Soil and Water Conservation District to determine what regulations may pertain to your operation. All Pennsylvania animal operations that generate manure are required to have a manure management plan, which is a simplified version of a nutrient management plan.

Risk Management

You may wish to consider several risk-management strategies for your operation. First, you should insure your facilities and equipment. This may be accomplished by consulting your insurance agent or broker. Second, you may want to protect the income from your swine operation with a crop insurance product called Livestock Gross Margin-Swine (LGM-Swine). This program provides protection against the loss of your gross margin (market value of livestock minus feed costs) by using futures prices to determine the expected gross margin and the actual gross margin. The LGM-Swine policy can be used to protect farrow-to-finish, feeder pig-to-finish, and segregated early weaned (SEW) operations. LGM-Swine is sold monthly and each insurance period is 6 months long and overlaps other insurance periods. Coverage begins 1 month after you buy a policy,

so coverage is available only for the last 5 months of the period. The insurance policy is continuous and renews automatically. You choose a deductible of from $0 to $20 (in $2 increments) with this policy.

Third, you may want to insure the income for your entire operation through a crop insurance program called Whole Farm Revenue Protection (WFRP). To use WFRP you must have 5 years of Internal Revenue Service (IRS) Schedule F forms. If your business structure is either a C or an S corporation, the necessary information can be entered into a Schedule F for crop insurance purposes. You can then contact an agent who sells crop insurance and insure the income of your operation. For more on agricultural business insurance, see "Agricultural Alternatives: Agricultural Business Insurance." For more information concerning crop insurance, contact a crop insurance agent or check the Pennsylvania Crop Insurance Education website at **extension.psu.edu/business/crop-insurance**.

Initial Resource Requirements

Farrow-to-Finish

- Land: 10 acres
- Labor (per sow per year):
  - 25 hours × 20 sows = 500 hours
- Capital:
  - Livestock (per head):
    $350 × 20 bred gilts = $7,000
  - Existing buildings, equipment, fencing:
    $20,000 to $25,000

Farrow-to-Feeder

- Land: 5 acres
- Labor (per sow per year):
  - 25 hours × 20 sows = 500 hours
- Capital:
  - Livestock (per head):
    $350 × 20 bred gilts = $7,000
  - Existing buildings, equipment, fencing:
    $15,000 to $20,000

Feeder-to-Finish

- Land: 10 acres
- Labor (per head):
  - 0.5 hours × 30 pigs = 15 hours
- Capital:
  - Livestock (per pig):
    $56.25 × 10 pigs = $562.50
  - Existing buildings, equipment, fencing:
    $10,000 to $12,000

Sample Budgets

The sample budgets included in this publication summarize costs and returns for swine production. Included in this publication are three sample budgets that summarize the costs and returns of farrow-to finish, farrow-to-feeder, and feeder-to-finish enterprises. These budgets should help ensure that you include all costs and receipts in your calculations. Costs and returns are often difficult to estimate in budget preparation because they are numerous and variable. Think of these budgets as an approximation and make appropriate adjustments using the "your estimate" column to reflect your specific production conditions. More information on using livestock budgets can be found in "Agricultural Alternatives: Budgeting for Agricultural Decision Making."

For More Information

Publications

Harper, J. K., S. Cornelisse, L. F. Kime, and J. Hyde. "Agricultural Alternatives: Budgeting for Agricultural Decision Making." University Park: Penn State Extension, 2013.

Penn State Agronomy Guide. University Park: Penn State College of Agricultural Sciences.

Center

U.S. Pork Center of Excellence
www.usporkcenter.org

Periodicals

Lancaster Farming
PO Box 609
Ephrata, PA 17522
lancasterfarming.com

National Hog Farmer
7900 International Drive, Suite 650
St. Paul, MN 55116
nationalhogfarmer.com

Pork Magazine
www.porkmag.com

For more information concerning pastured pork, contact Tony Nye (Nye.1@osu.edu), extension educator, The Ohio State University.

Sample Farrow-to-Finish Swine Budget

Twenty sows weaning nine pigs per litter at 28 days and 2.3 litters per sow per year and selling at a market weight of 280 pounds.

ITEM	QUANTITY USED/SOLD		UNIT	PRICE PER CWT. VALUE		PER HERD	YOUR ESTIMATE
Receipts							
Market hogs (5% death loss)[1]	393		head	$168.00		$66,024.00	
Cull sows[2]	8		head	$148.75		$1,190.00	
Total receipts						**$67,214.00**	
VARIABLE COSTS PIGS TO 280 POUNDS	**AVERAGE POUNDS PER PIG**	**DAYS FED**	**COST PER POUND**				
Nursery/starter feed (3#/hd/d)	126	42	$0.13			$6,437.34	
Grower feed (5#/hd/d)	285	57	$0.12			$13,440.60	
Finisher feed (7#/hd/d)	455	65	$0.11			$19,669.65	
Sows							
Gestation feed (5.5#/hd/d)	1,653	301	$0.12			$3,967.20	
Lactation feed (15#/hd/d)	966	64	$0.13			$2,511.60	
Total feed costs						**$46,026.39**	
OTHER VARIABLE COSTS	**QUANTITY**		**UNIT**	**COST**	**TIMES**	**TOTAL**	
Replacement gilts	8		gilts	$200.00		$1,600.00	
Vet. and medicine per sow	20		hog	$20.00		$400.00	
Artificial insemination per sow	100		units	$20.00	2.3	$4,600.00	
Electricity per month	40		sows	$12.00		$480.00	
Heating per month	40		sows	$20.00		$800.00	
Marketing/trucking	393		hog	$10.00		$3,930.00	
Truck and tractor per month	50		hours	$20.00		$1,000.00	
Labor	500		hour	$13.00		$6,500.00	
Interest on operating capital[3]				$531.30		$531.30	
Total variable costs						**$61,267.69**	
FIXED COSTS[4]							
Insurance, taxes, and repairs	20		sows	$24.85		$497.00	
Equipment[5]	20		sows	$17.69		$353.80	
Farrowing building[6]	20		sows	$14.85		$297.00	
Gestation building[6]	20		sows	$26.40		$528.00	
Nursery building[6]	20		sows	$39.60		$792.00	
Finisher building[6]	20		sows	$19.80		$396.00	
Interest on investment						$983.99	
Total fixed costs						**$2,863.80**	
Total Costs						**$64,131.49**	

1. Number of 280 pound pigs raised per sow per year.
2. Based on culling 40% of sows per year at 425 pounds.
3. Calculated at 6% of average variable costs.
4. Fixed costs are based on a 20 sow herd and a 1% death loss.
5. Based on the equipment needed divided by 20 sows.
6. Building costs are based on remodeling existing buildings; new construction may cost considerably more.

You should monitor local markets and contact suppliers to determine current prices for all items contained in this sample budget.

FINISHED HOG PRICE	PRICE PER CWT.	VALUE PER HOG	GROSS MARGIN PER HOG	NET RETURN PER HOG
Low	$55.00	$154.00	($1.90)	($9.18)
Medium-Low	$60.00	$168.00	$12.10	$4.82
Medium	$65.00	$182.00	$26.10	$18.82
Medium-High	$70.00	$196.00	$40.10	$32.82
High	$75.00	$210.00	$54.10	$46.82
Price needed to cover variable costs		**$55.68**		
Price needed to break even		**$58.28**		

Sample Farrow-to-Feeder Swine Budget

Twenty sows weaning nine pigs per litter at 28 days and 2.3 litters per sow per year at a market weight of 50 pounds.

ITEM	QUANTITY USED/SOLD		UNIT	PRICE/VALUE		PER HERD	YOUR ESTIMATE
Receipts							
Feeder pigs (2% death loss)[1]	406		head	$65.00		$26,390.00	
Cull sows[2]	8		head	$148.75		$1,190.00	
Total receipts						$27,580.00	
VARIABLE COSTS PIGS TO 50 POUNDS	**AVERAGE POUNDS PER PIG**	**DAYS FED**	**COST PER POUND**				
Nursery/starter feed (3#/hd/d)	126	42	$0.13			$6,650.28	
Sows							
Gestation feed (5.5#/hd/d)	1,653	300.5	$0.12			$3,967.20	
Lactation feed (15#/hd/d)	966	64.5	$0.13			$2,511.60	
Total feed costs						**$13,129.08**	
OTHER VARIABLE COSTS	**QUANTITY**		**UNIT**	**COST**	**TIMES**	**TOTAL**	
Replacement gilts	8		gilts	$200.00		$1,600.00	
Vet. and medicine /sow	20		sows	$20.00		$400.00	
Artificial insemination/sow	100		units	$20.00	2.3	$4,600.00	
Electricity/month	30		sows	$12.00		$360.00	
Heating/month	40		sows	$20.00		$800.00	
Marketing/trucking	406		hog	$4.00		$1,624.00	
Truck and tractor/month	50		hours	$20.00		$1,000.00	
Labor	500		hour	$13.00		$6,500.00	
Interest on operating capital[3]				$458.52		$458.52	
Total variable costs						**$25,871.60**	
FIXED COSTS[4]							
Insurance, taxes, and repairs	20		sows	$18.85		$377.00	
Equipment for sows[5]	20		sows	$17.70		$354.00	
Farrowing/nursery buildings[6]	20		sows	$39.60		$792.00	
Gestation building[6]	20		sows	$19.80		$396.00	
Interest on investment				$746.39		$746.39	
Total fixed costs						**$2,665.39**	
Total Costs						**$28,536.99**	

1. Number of 45 pound pigs raised minus 2% death loss.
2. Based on culling 40% of sows per year at 425 pounds.
3. Calculated at 6% of average variable costs.
4. Fixed costs are based on a 20 sow herd with a 0.5% death loss.
5. Based on the equipment needed divided by 20 sows.
6. Building costs are based on remodeling existing buildings; new construction may cost considerably more.

You should monitor local markets and contact suppliers to determine current prices for all items contained in this sample budget.

FEEDER PIG PRICE	PRICE PER PIG	GROSS MARGIN PER PIG	NET RETURN PER PIG
Low	$50.00	$(13.72)	($20.29)
Medium-Low	$57.50	$(6.22)	$(12.79)
Medium	$65.00	$1.28	$(5.29)
Medium-High	$72.50	$8.78	$2.21
High	$80.00	$16.28	$9.71
Price needed to cover variable costs	**$63.72**		
Price needed to break even	**$70.29**		

Sample Feeder-to-Finish Swine Budget

Purchasing three groups of ten pigs at 45 pounds per year and selling at a market weight of 280 pounds. The estimated grower feed eaten per pound of live weight gain is 2.5 pounds and the estimated finisher feed eaten per pound of live weight gain is 2.8 pounds.

ITEM	QUANTITY SOLD		UNIT	VALUE PER HEAD	TOTAL	YOUR ESTIMATE
Receipts						
Market hogs (2% death loss)	29		cwt.	$168.00	$4,872.00	
VARIABLE COSTS						
Feeder pigs	30			$56.25	$1,687.50	
	FEED CONSUMED	**WEIGHT GAIN**	**FEED COST PER POUND**			
Grower feed (5#/hd/d)	263	105	$0.12		$915.24	
Finisher feed (7#/hd/d)	364	130	$0.11		$1,161.16	
Total pig plus feed costs					**$3,763.90**	
OTHER VARIABLE COSTS	**QUANTITY**		**UNIT**	**COST**	**TOTAL**	
Vet. and medicine	29		hogs	$3.00	$87.00	
Electricity	29		hogs	$0.75	$21.75	
Supplies	29		hogs	$0.40	$11.60	
Marketing	29		hogs	$10.00	$290.00	
Truck and tractor	29		hogs	$1.25	$36.25	
Labor	14.5		hour	$13.00	$188.50	
Miscellaneous	29		hogs	$0.60	$17.40	
Interest on operating capital[1]				$326.23	$326.23	
Total variable costs					**$4,742.63**	
FIXED COSTS[2]						
Insurance, taxes, and repairs	29		hogs	$6.52	$189.08	
Building and equipment[3]	29		hogs	$34.62	$1,003.98	
Interest on investment				$374.37	$374.37	
Total fixed costs					**$1,193.06**	
Total Costs					**$5,935.69**	

1. Equals 4% x (120 days/365 days) x (cost of feeder pig/0.5 x all variable costs).
2. Fixed costs are based on purchasing 10 pigs per time and selling 9 pigs.
3. Overhead costs on facilities equal to annual payment required to repay amount in price column in 10 years at 6% interest, divided by three groups a year. You should monitor local markets and contact suppliers to determine current prices for all items contained in this sample budget.

FINISHED HOG PRICE	PRICE PER CWT.	INCOME PER HOG	GROSS MARGIN PER HOG	NET RETURN PER HOG
Low	$55.00	$154.00	($9.54)	($50.68)
Medium-Low	$60.00	$168.00	$4.46	$(36.68)
Medium	$65.00	$182.00	$18.46	$(22.68)
Medium-High	$70.00	$196.00	$32.46	$(8.68)
High	$75.00	$210.00	$46.46	$5.32
Price needed to cover variable costs		**$58.41**		
Price needed to break even		**$73.10**		

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