
AGRICULTURAL ALTERNATIVES

<http://agalternatives.aers.psu.edu>

Bobwhite Quail Production

Bobwhite quail are game birds indigenous to the United States. Their distinctive call, color, and flight patterns make them popular with hunters and wildlife enthusiasts. In Pennsylvania and other parts of the country, loss of natural habitats has created market demand for commercially bred birds, which are used to stock shooting preserves and wild areas. More than 250,000 birds are produced in the United States annually.

Several species of bobwhite quail are available to professional breeders. The Eastern bobwhite is the most common species in the wild and in confinement, but four other species are found in the United States: Plains bobwhite, masked bobwhite, Texas bobwhite, and Florida bobwhite. Many of the commercially available strains, such as the pharaoh or jumbo bobwhite, have been selected for marketing traits, such as appearance, meat production, or egg production. All strains and breeds of quail are gallinaeous birds, related to grouse, wild and domestic turkeys, pheasants, partridges, and chickens.

One of the most practical ways to begin production is to raise a flock of 500 to 1,000 quail, using existing facilities when feasible. A unit of this size enables producers to learn the necessary production and marketing skills without making a large capital investment. Investment costs are limited to a brooder house, water troughs, feeders, a heat source, and a flight pen.

This publication was developed by the Small-scale and Part-time Farming Project at Penn State with support from the U.S. Department of Agriculture-Extension Service.



Marketing

As with any business, quail producers need to carefully research possible markets before starting production. The major markets for quail include a) hunting preserves and field trial stock; b) private individuals who buy live birds to train hunting dogs; and c) individuals who want to restock birds in the wild. Secondary markets for bobwhite quail include custom slaughter gourmet food outlets (mostly restaurants and usually involves USDA requirements) and egg production.

At present, there are approximately 20 commercially regulated and 200 privately regulated shooting grounds in Pennsylvania. Their names and addresses are available from the Pennsylvania Game Commission. Because there is very little information about quail markets, it will require time to research and develop potential markets.

PENNSTATE



College of Agricultural Sciences
Agricultural Research and Cooperative Extension

Basic Production and Management

State wildlife regulations control the rearing and release of quail. Start with either eggs or day-old chicks from reputable dealers. Before obtaining eggs or stock, make sure that the breeders are free of diseases, including *Salmonella pullorum*, *Salmonella typhoid*, and *Mycoplasma*. Information about various dealers can be obtained from the Pennsylvania game bird industry or the Penn State Department of Poultry Science.

If you purchase eggs, keep them in a clean environment at an ambient temperature between 55 and 65°F, before setting. Eggs can only be held for about 7 to 10 days before hatchability is decreased, but it is best to set them within 3 to 7 days after they are laid. Whether you purchase or build an incubator, it should be well ventilated, able to turn the eggs easily, and made of an insulated material that is easy to clean and disinfect. The incubator also should maintain a temperature to within .25°F and should easily supply 60 percent relative humidity. Set only clean eggs at a temperature of 99.5 to 100°F for 24 days. Turn the eggs at least three times each day. Many producers mark small groups of eggs on one side to indicate that they have been turned. For larger numbers of eggs, you will need an automatic or manual turner. After hatching, remove the chicks and the hatch residue. Thoroughly clean and disinfect the incubator.

Whether you hatch your own chicks or purchase day-old chicks, planning is very important. Make sure all water troughs, feeders, and heat sources are working before the chicks arrive. Young quail can fit through very small spaces and have a tendency to drown in shallow water. Make sure all openings in the brooding area are closed tightly. Also, use appropriate watering equipment or use screening over waterers. Small producers will actually place marbles or clean gravel in the water trays for the first week or two to help prevent drowning.

The first weeks are critical for helping chicks to get a good start. Place the chicks in a warm environment that has readily available feed and water. Since they are unable to regulate their body temperature for the first 10 days, a properly managed heat source is necessary, such as electrical lights, heat lamps, propane heaters, or kerosene heaters. The most efficient heat source will depend on your particular housing situation. Set the room temperature at approximately 88°F with a temperature of around 95°F right under the heat source.

Round all corners of the initial brooding area with cardboard or wire to prevent birds from smothering. Chicks are very active and tend to crowd on top of one another when frightened, which can be fatal in commercial confinement situations. Chick guards are also used for the first week or two to help keep the chicks near the heat source and prevent piling. However, once the chicks begin to fly, remove the guard so chicks do not get stranded on the wrong

side of the guard. Carefully observe the birds' behavior and increase the temperature if you observe huddling, or decrease the temperature if birds seem to be driven away from the heat source. Gradually decrease the room temperature each day (5° per week) until it reaches 70°F.

Producers can effectively brood quail in colony cages, but do not leave birds in the cages too long or the quality of their feathering can be affected. Use colony cages with ¼-inch mesh wire for the floor to prevent leg and foot damage to the young quail. Maintain a density of four birds per square foot for the first week. Decrease the density to three birds per square foot when they are 2 to 6 weeks old.

Space Requirements

AGE	LINEAR INCHES/BIRD		FLOOR SPACE (SQ. FT./BIRD)	%PROTEIN
	FEEDER SPACE	WATERER SPACE		
0–8 wks	.6"	.25"	.3	28%
6–14 wks	1"	.3"	.2	20%
Over 14 wks	1"	.3"	2 *	13–14%
Breeder	1"	.3"	1 sq ft in floor pens .5 sq ft in cages	18–20%

*including flight pen for flight birds. If raising for meat, can drop to 1.5 sq. ft./bird until birds are marketed.

The method used to rear the birds will depend on which marketing option you choose. Hunting preserves, field trials, and dog trainers want small, fast-flying quail; therefore, producers should move young chicks into flight pens that provide a density of two square feet per bird. To shelter the birds from humans and protect them from predators, plant vegetation inside the pens, cover the tops with mesh, and bury chicken wire along the base of the outer sides of the pen. Most hunting preserves prefer to purchase the birds at 15 to 16 weeks of age.

Birds used for meat or egg production should be raised in a confined facility with controlled temperatures and less light. This practice will reduce bird activity and cannibalistic tendencies, as well as improve feed conversion. Some producers market bobwhite quail for meat as a secondary market. Provide adequate ventilation and sufficient feed and water since any damage to carcass quality will lower meat yield and the price received. For best meat production, larger breeds of Coturnix (Japanese) quail are usually raised since they grow more efficiently and produce larger, meatier carcasses.

Feeding Quail

It is important that you use a sound feeding program since gamebirds require higher levels of protein than most fowl. Many high-quality commercial gamebird feeds are available through local feed companies. Commercial turkey diets can also be used and will provide a well-balanced diet for gamebirds.

During the first 6 to 8 weeks of age, feed quail a 28% protein starter feed in crumble or mash form. From 8 to 14 weeks, feed a 20% protein grower feed, pelleted or crumbled and can be mixed with whole grain feeds. When feeding whole grain feeds, be sure to mix them with the pelleted feeds at the proper ratio to assure proper balance of nutrients. You can begin feeding a maintenance diet at 14 weeks since most of the birds' growth is complete. Maintenance diets of 13–14% protein are recommended until the birds are released or before breeding season. Most maintenance diets are high in whole grains.

If you plan to use your birds as breeders, you will need to change over to a high-quality 18–20% protein breeder ration at least 4 to 6 weeks before desired breeding season. For best results, change over from maintenance feed to breeder diet gradually over a week. Mix the two feeds evenly for the first 2 days. Then remove 25% of the maintenance feed incrementally until it is 100% breeder feed.

Health Programs

Because of the industry's small size, few medications have been approved for use in quail production. Biosecurity and sanitation are necessary to prevent the outbreak of disease. Biosecurity involves purchasing stock from disease-free sources, isolating birds by age group, restricting human access to the buildings, keeping the buildings clean, and properly disposing of dead birds. To prevent the introduction of diseases, only introduce new stock as chicks or eggs. If it is necessary to introduce started or adult birds to your flock, isolate the new stock from your present flock for at least a month.

Special Considerations

The Pennsylvania Game Commission (PGC) has several regulations concerning the raising and hunting of gamebirds. The PGC requires that you have a permit for a) the possession and propagation of gamebirds, and b) operation of hunting grounds and preserves. These permits require you to abide by several laws and regulations before obtaining and holding a permit.

To obtain a permit or further information, contact your regional PGC office or the state office for the Pennsylvania Game Commission, Bureau of Wildlife Management, Propagation Division, 2001 Elmerton Avenue, Harrisburg, PA 17110, http://sites.state.pa.us/PA_Exec/PGC/index.htm.

Sample Budgets

Two sample budgets are included that summarize costs and returns a) for producing quail to sell for flight birds for hunting preserves, field trials, and release, and b) for meat bird production and restaurants. The budgets assume that three groups of 1,000 birds were produced each year (spring, summer, and fall). Both budgets assume a 12-week production cycle.

These budgets have been developed with the best information from all sources available (ag specialist, industry, and government) but they are still an approximation. To make adjustments to the budgets, use the "your estimate" column to reflect your specific production conditions. More information on using crop/livestock budgets can be found in *Agricultural Alternatives: Enterprise Budget Analysis*.

Initial resource requirements

- Land: 1 acre
- Labor: 364 hours
- Capital
 - Birds: 3,000 x \$0.24 = \$220
 - Buildings and equipment: \$3,600

Sample Quail Budget (Flight Birds)

For sale as flight birds; birds purchased at 1 day old and sold at 12 weeks; three groups of 1,000 birds (3,000 total) are produced per year.

Item	Quantity	Unit	Price	Three Flock	Your Estimate
Receipts					
Birds (15% death loss)	2,550	birds	\$2.75	\$7,012.50	_____
<i>Total receipts</i>				\$7,012.50	_____
Variable costs					
Costs per chick	3,000	chick	\$0.24	\$720.00	_____
Feed costs (50-pound bag)	8,568	pounds	\$0.125	\$1,071.00	_____
Utilities			\$215.00	\$215.00	_____
Supplies and miscellaneous			\$220.00	\$220.00	_____
Marketing			\$180.00	\$180.00	_____
Maintenance			\$180.00	\$180.00	_____
<i>Total variable costs</i>				\$2,586.00	_____
Fixed costs					
Labor (yearly)	364	hours	\$0.00	\$0.00	_____
Buildings and equipment	10	years	\$3,600.00	\$360.00	_____
Insurance and taxes			\$50.00	\$50.00	_____
<i>Total fixed costs</i>				\$410.00	_____
Total costs				\$2,996.00	_____
Returns					
Returns over variable costs				\$4,426.50	_____
Net returns				\$4,016.50	_____
Net returns over variable costs for different prices received.					
Prices received	\$2.50	\$2.65	\$2.75	\$3.00	\$3.25
Net returns over variable costs	\$3,789.00	\$4,172.00	\$4,427.00	\$5,064.00	\$5,702.00
Net returns over total costs for different prices received.					
Prices received	\$2.50	\$2.65	\$2.75	\$3.00	\$3.25
Net returns over total cost	\$3,379.00	\$3,762.00	\$4,017.00	\$4,654.00	\$5,292.00

Sample Quail Budget (Meat Birds)

For sale as meat birds; birds purchased at 1 day old and sold at 13 weeks; three groups of 1,000 birds are produced per year.

Item	Quantity	Unit	Price	Three Flock	Your Estimate
Receipts					
Birds (15% death loss)	2,550	birds	\$3.10	\$7,905.00	_____
<i>Total receipts</i>				\$7,905.00	_____
Variable costs					
Costs per chick	3,000	chicks	\$0.24	\$720.00	_____
Feed costs (50-pound bag)	9,112	pounds	\$0.125	\$1,139.00	_____
Utilities			\$215.00	\$215.00	_____
Supplies and miscellaneous			\$220.00	\$220.00	_____
Marketing			\$180.00	\$180.00	_____
Maintenance			\$180.00	\$180.00	_____
<i>Total variable costs</i>				\$2,654.00	_____
Fixed costs					
Labor (yearly)	364	hours	\$0.00	\$0.00	_____
Buildings and equipment	10	years	\$3,250.00	\$325.00	_____
Insurance and taxes			\$50.00	\$50.00	_____
<i>Total fixed costs</i>				\$375.00	_____
Total costs				\$3,029.00	_____
Returns					
Returns over variable costs				\$5,251.00	_____
Net returns				\$4,876.00	_____
Net returns over variable costs for different prices received.					
Prices received	\$2.50	\$2.85	\$3.10	\$3.30	\$3.50
Net returns over variable costs	\$3,721.00	\$4,614.00	\$5,251.00	\$5,761.00	\$6,271.00
Net returns over total costs for different prices received.					
Prices received	\$2.50	\$2.85	\$3.10	\$3.30	\$3.50
Net returns over total cost	\$3,346.00	\$4,239.00	\$4,876.00	\$5,386.00	\$5,896.00

For More Information

The Game Bird Bulletin

Pennsylvania Game Breeders Association
Circulation and membership managed by:
Susquehanna Design & Printing
510 Union St.
PO Box 250
Millersburg, PA 17061

The Wildlife Harvest

Wildlife Harvest Publications, Inc.
PO Box 96
Goose Lake, IA 52750
PHONE: 319-242-3046

Associations

PA Game Breeders Association
288 Levengood Road
Douglassville, PA 19518

Pennsylvania Game Commission
Bureau of Wildlife Management
Propagation Division
2001 Elmerton Avenue
Harrisburg, PA 17110
http://sites.state.pa.us/PA_Exec/PGC/index.htm

Poultry Extension at Penn State
Department of Poultry Science
The Pennsylvania State University
213 Wm. L. Henning Building
University Park, PA 16802
PHONE: 814-865-5573
<http://ulisse.cas.psu.edu/ext/Default.html>

American Pheasant and Waterfowl Society
W2270 U.S. Highway 10
Granton, WI 54436
<http://www3.upatsix.com/apws/>

PennAg Industries Association
Poultry Council
Northwood Office Center
2215 Forest Hills Drive – Suite 39
Harrisburg, PA 17112-1099
PHONE: 717-651-5920
E-MAIL: jshirk@pennag.com

North American Gamebird Association
1214 Brooks Avenue
Raleigh NC 27607
E-MAIL: gamebird@naga.org
<http://www.NAGA.org/>

Quail Unlimited
31 Quail Run
PO Box 610
Edgefield SC 29824
PHONE: 803-637-5731
<http://www.qu.org/>

Prepared by Phillip J. Clauer, senior extension associate in poultry science; George L. Greaser, senior research associate in agricultural economics; R. Michael Hulet, professor of poultry science; and Jayson K. Harper, professor of agricultural economics.

Visit Penn State's College of Agricultural Sciences on the Web: <http://www.cas.psu.edu>

Penn State College of Agricultural Sciences research, extension, and resident education programs are funded in part by Pennsylvania counties, the Commonwealth of Pennsylvania, and the U.S. Department of Agriculture.

This publication is available from the Publications Distribution Center, The Pennsylvania State University, 112 Agricultural Administration Building, University Park, PA 16802. For information telephone (814) 865-6713.

Where trade names appear, no discrimination is intended, and no endorsement by the Penn State College of Agricultural Sciences is implied.

Issued in furtherance of Cooperative Extension Work, Acts of Congress May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture and the Pennsylvania Legislature. T. R. Alter, Director of Cooperative Extension, The Pennsylvania State University.

This publication is available in alternative media on request.

The Pennsylvania State University is committed to the policy that all persons shall have equal access to programs, facilities, admission, and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by state or federal authorities. It is the policy of the University to maintain an academic and work environment free of discrimination, including harassment. The Pennsylvania State University prohibits discrimination and harassment against any person because of age, ancestry, color, disability or handicap, national origin, race, religious creed, sex, sexual orientation, or veteran status. Discrimination or harassment against faculty, staff, or students will not be tolerated at The Pennsylvania State University. Direct all inquiries regarding the nondiscrimination policy to the Affirmative Action Director, The Pennsylvania State University, 201 Willard Building, University Park, PA 16802-2801, Tel 814-865-4700/V, 814-863-1150/TTY.

© The Pennsylvania State University 2002

Produced by Information and Communication Technologies in the College of Agricultural Sciences

CAT UA300

rev3M4/02acg3995(d)