

# Livestock Enterprises for the Part-time Farm

According to the American Farmland Trust (Thompson, 1986), small and part-time farms comprised 86 percent of all North American farms in 1986. Almost half (48 percent) of all small farm operators are employed full-time off the farm. A part-time farm is one on which the farm family does not rely as the primary source of family income. Choosing enterprises and fitting them together to best use the available resources of the farm and farm family is an important aspect of part-time farm management.

This bulletin is designed to provide basic information about raising livestock on the part-time farm. The information should be considered fundamental; specific information directly related to the chosen enterprise(s) should be sought. At the end of this bulletin, and also in Fact Sheet 641 "Resource List for Part-time Farmers" you will find a source list for further information. Your local, county, or regional Cooperative Extension Service office will be happy to assist you with any questions or problems you have with your operation.

## Livestock Production

Small-scale livestock production is well suited to the part-time farm. The labor involved in raising certain livestock species may be minimal. For example, raising grazing livestock such as sheep, cattle, and goats allows the use of land that is too hilly, too rugged, or otherwise unsuitable for crop production. Livestock also helps maintain or improve soil fertility by providing manure.

On many part-time farms, livestock is raised as a hobby or for 4-H and Future Farmers of America youth projects. Educational and therapeutic benefits may outweigh the costs of production. Livestock gives some people more satisfaction than crops, but at the same time livestock confines you to the farm, especially during certain seasons, such as birthing. Livestock may also require above-average management skills to return a profit. Animals such as dairy cows may require specialized and expensive buildings and equipment, which makes raising them on a part-time farm unfeasible.

## Resource Evaluation

It is important to analyze your resources before choosing any livestock system. The quantity and quality of your available land, buildings, and fencing are important aspects

to consider. It is also important to determine how much labor will be available for the enterprise. For example, available labor may be limited to 1 hour in the morning and 2 hours in the evening or to a child's helping out after school and during the summer for a limited time each day. It is also critical to determine the amount of capital that can be devoted to the operation, as well as the expected returns.

## Decisionmaking

A number of decisions must be made regarding livestock, regardless of the species that you decide to raise. For example, when you select livestock, you must decide whether to purchase and raise purebred or commercial stock, which breed or crossbreed (type) to raise, and what quality of animal. Other decisions include health standards and maintenance practices for the herd, age of the animals, whether to maintain a breeding herd, whether to buy open (nonpregnant) or pregnant animals, and when and where to buy the animals.

When you buy capital items-buildings, tractors, and feeding or weighing equipment-decide what items are necessary for feeding, breeding, and housing the animals and what storage capacity you will need. Ask pertinent questions about each item: Is it feasible? How will I pay for it? Is it necessary for the success of the operation? Will it do the job? What added expenses may be needed to support the item if it is purchased? Will it provide labor or cash savings? How frequently will it be used?

## Feed Budgets and Water Supply

Feed budgets take into consideration the quantity and quality of feed needed and specific feeding schedules. Determine how much feed can be produced on the farm-standing pasture forage, harvested forage (hay, haylage, or silage), or grain. When you consider harvested forage and grain, it is important to consider the economics of production, harvesting, and storage. If land suitable for crop production is available, it may be less expensive to rent your property to a local farmer for production and to purchase feedstuffs rather than purchase or rent the equipment for your own production. Hiring custom work also may be an alternative.

In the Northeast United States, the average grazing season is April through November. The actual length of grazing depends on the condition of the pastures, the climate, and whether permanent or rotational pastures are used. Extending the grazing season is possible, but it requires additional inputs and management.

A reliable source of water is essential for any livestock enterprise. All animals require a readily available supply of clean water on a daily basis. Too much or too little water can limit many enterprises. Excessive water may be controlled with the use of diversion ditches, drain tiles, or ponds.

## Farm Records

Record keeping is a critical component of any farming operation. Production and financial records must be maintained for State and Federal tax purposes. Record keeping also can help pinpoint areas in which improved management may make substantial differences in profit or production. You may want to keep track of animal production records such as feed consumption, growth rate, and veterinary expenses. A calendar of jobs and labor needs is also important. Financial costs and returns should be summarized. You must also decide how you will keep track of these records—whether in notebooks or with personal computer programs.

## Marketing

Marketing is the most limiting factor in realizing a profit from a livestock enterprise. Marketing involves producing or promoting a product that satisfies a customer's need or desire and is available at a desirable place and price. You must decide what markets are available for any commodity you may consider producing.

Local auctions provide one means for marketing livestock. Is there a local butcher or slaughterhouse that will accept your animal for a direct-to-consumer freezer product? Are there any local establishments that will purchase locally raised products? When considering this marketing alternative, be aware of any State or Federal health and marketing regulations. It is important to determine the market outlets for a product prior to beginning an enterprise. Developing a marketing plan is one of the most crucial early steps in determining if there is the potential for realizing a profit in the animal enterprise.

## Beef Cattle

The part-time farm is well suited to raising beef cattle. The beef enterprise usually requires minimal labor inputs and a moderate amount of management. Specialized buildings and costly equipment are not often required. Roughages, which might otherwise be wasted, can be used by the cattle.

Disadvantages to raising beef cattle, however, do exist. The land required to raise cattle efficiently ranges from 1 to 5 acres per animal. The net returns of the beef operation tend to be low, and the income is seasonal. All animals, beef cattle included, require year-round attention.

## Types of Beef Enterprises

Beef enterprises range from low-risk, cow-calf and yearling grass-stocker operations to riskier (and potentially more profitable) cattle-finishing enterprises.

Raising beef cattle on the part-time farm allows you many options; you may keep superior livestock for future breeding in your herd, increasing the size of the herd, and sell excess livestock as feeder calves or finished beef. You also may produce beef for your own family to eat.

The goal of the cow-calf program is to produce a calf from each cow every year. The main salable product is feeder calves weighing about 450 pounds at about 7 months old.

It takes 16 to 20 months to raise a young calf into a 1000- to 1300-pound beef animal ready for market. "Feeding out" calves to market weight can be risky because of the time involved and the seasonal variability in market prices. The advantage of purchasing yearling cattle and raising them on pasture and grain is that your money is tied up for only 5 or 6 months while the cattle are growing to market weight. Finishing often means confining cattle in a lot and feeding them a grain-based diet.

## Feeding Cattle

Most beef operations can make use of pasture land and home-raised forage, keeping cash investment to a minimum. If ample, high-quality pasture is available, supplemental feeding may not be required during at least 6 months of the year. To provide optimum nutrition to the animal, forages should be tested for nutrient content, and pastures should be renovated and maintained according to Extension Service recommendations.

Because the goal of the cow-calf operation is to produce calves that weigh a minimum of 450 pounds, a knowledge of nutrition, feedstuff composition, and feeding management is fundamental. Beef cattle are foraging animals and require large amounts of roughage in their diets. The stomach of a cow is divided into four compartments, one of which allows the animal to convert grass and other roughages into meat and milk. Thus, grazing pasture is an important and economical means of feeding cattle.

Minimum nutrient requirements vary depending on the physiological status of the animal. A beef cow and her calf require protein, energy, vitamins, minerals, and water. The amount they need depends on whether they are mature, pregnant and producing milk, or growing. Nutritional needs also increase during extreme temperatures—above

80 °F or below 0 °F—especially if adequate shade or shelter is not available.

A beef cow can meet her nutritional requirements under most conditions from pasture, hay, and mineral supplements, with little or no grain. Poor quality roughages often are adequate during early to mid-gestation. Good quality pasture, silage, or hay, plus grain, can be used to meet requirements during late gestation and through rebreeding. Growing cattle are fed some grain with roughage to speed up the rate of growth and reduce the time needed to reach market weight.

The timing and amount of hay, grain, or silage required depend on the proportion of roughage to grain in the ration, the sex and type of cattle, environmental conditions, and management practices. The National Resource Council has determined the precise nutrient needs for each class of cattle. Your local Extension agent can help you determine exact nutritional needs, rations, and a feed budget for your herd.

## Housing and Equipment

Building and equipment requirements for a small beef herd are minimal. Beef cattle do not need elaborate housing and do best if they are kept outside under most conditions. As they digest forages, cattle produce large amounts of heat, which maintains their body temperature, eliminating the need to confine them inside during cold weather. In fact, confining cattle increases the incidence of diseases such as scours (severe diarrhea) and respiratory problems. A mature beef cow with a good coat and adapted to a cold climate has a critical temperature of 0 °F. Below that temperature, extra energy (supplied through feed) is needed to keep the animal warm. It is, however, important that cattle be sheltered from wind, cold rain, and mud. A woodlot, a three-sided shed, a windscreen, or an old barn remodeled for easy cleaning will provide adequate shelter. It is best to enclose some calving pens where cows can be managed should calving problems arise. It also may be necessary to have a separate area for wintering first and second year cows (heifers) and older cattle to ensure that they get an adequate amount of feed.

Beef-cattle production requires sturdy, high-quality fencing. A well-built fence can save countless frustrating hours chasing cattle. Recent advances in fencing technology have provided the livestock producer with many cost-effective options. Your local Extension agent or fence dealer can provide you with excellent instructions for inexpensive do-it-yourself fencing.

It is important that a barn or shed be available for hay storage for winter feeding. Feed bunks and hay racks should be built to avoid feed wastage. A working and sorting area that contains at least two pens and an alley with a head gate at the end is helpful for sorting, catching, and treating cattle. Feed bunks and working and sorting areas can be built easily with your own labor and readily available mate-

rials. Plans can be obtained from your local Extension office.

## Reproduction in Cattle

Beef cattle ovulate, come into heat, mate, and conceive at any time during the year. A nonpregnant female ovulates and comes into heat about every 21 days and stays in heat for 12 to 24 hours. Conception depends on the age, health, and nutritional status of the cow. A heifer is ready for breeding when she is 12 to 15 months old or 550 to 750 pounds. She may come into heat as early as 6 months; if so, she should not be housed or kept with bulls (even young bulls) to avoid premature breeding. Serious calving problems are likely to occur if the heifer is bred too early.

A cow calves from 270 to 285 days after conception. Most fetal growth occurs in the last 60 days of pregnancy. Milk flow begins shortly before calving.

There are a number of signs of impending labor in the cow. Most mature cows do not need assistance in calving, but first-calf heifers or cows bred to large bulls may need help. The cow should be in a clean and dry area for calving to avoid germs that can cause diseases, such as scours, in the newborn calf.

After calving, the calf should be dried off if the weather is cold. The calf's navel should be immersed in tincture of iodine, and the calf should begin nursing as soon as possible. The first milk (colostrum) contains antibodies against disease and is most effectively absorbed by the calf within the first few hours after birth. The calf should also be ear-tagged for identification and given an injection of vitamins A and D. An anti-scours vaccine may be administered at this time.

The cow should be observed after calving to be certain that the placenta is expelled. A retained placenta, heavy discharge, or a strong odor after calving may indicate the presence of a uterine infection.

Male cattle (bulls) reach puberty at about the same age and size as females of the same breed. If bull calves are not castrated, they should be separated from nonpregnant females at about 7 months, which is the usual weaning age. The bull can be used to breed a limited number of females when he is 12 to 14 months old. At 3 to 4 years, the bull is mature and can be used to breed 25 to 30 cows per breeding season.

It is important to decide whether you will let your herd breed naturally or will manipulate the breeding program in any way. Artificial insemination (AI) allows use of semen from superior bulls without having to purchase or maintain the bulls on the property. Using AI requires additional management and labor during the breeding season.

## Beef Herd Health and Management

There is a greater demand for castrated male beef cattle (steers) than intact males because steers are easier to man-

age in a feedlot. Also, there is less demand for meat from bulls. The beef from young bulls slaughtered by about 14 months old, however, may be just as acceptable as beef produced from steers and heifers. Young bulls that will not be kept for breeding should be castrated. There are several methods of castration. Castration is generally easier, and it causes the least amount of stress when it is performed before the calf is 3 months old. Contact your Extension agent or local veterinarian before attempting this procedure.

Cattle should also be dehorned to prevent injury to other cattle and to handlers. Use a caustic dehorning paste or a tube dehorner on the horn button of calves with undeveloped horns. Saws or electric dehorners must be used on older cattle with developed horns. Several breeds of cattle are naturally hornless (polled), which you may want to consider when you plan your breeding program.

The overall success of a beef operation depends on maintaining the animal's health through preventative health management. Cows should be vaccinated after calving but before breeding for infectious bovine rhinotracheitis (IBR), leptospirosis, and vibriosis, as well as against other disease agents that may be present in your area. Your local veterinarian can provide additional information. Heifers should be vaccinated for brucellosis and IBR between the ages of 3 and 8 months.

The herd should be monitored for pneumonia, pinkeye, and footrot and should be treated promptly if these conditions occur. External and internal parasites also must be controlled. Further reading is important to become familiar with various cattle diseases and their prevention and with herd maintenance programs. It is advisable to establish a veterinary-client relationship with a local large-animal veterinarian.

## Marketing Beef Cattle

Generally, beef cattle are sold year-round. There are several alternatives for marketing a calf or cattle crop. The primary markets are terminal markets, livestock auctions, direct farmer-to-farmer or farmer-to-consumer sales, breeding stock sales, and specialized club calf sales. The best marketing method depends on the season, the number of cattle to be sold, and the quality of the product. Restaurants and caterers may purchase locally raised cattle if they are approached. Contact restaurant managers or your county Extension office for more information about this market outlet.

For more information on the beef cattle enterprise, consult your local Extension agent or Extension livestock specialists.

## Sheep

A relatively low initial investment and the natural, gradual increase in the size of a flock make sheep an ideal

enterprise for the part-time farm. Sheep require very little labor, except at lambing time, and most of their feed requirements can be met from pasture land and farm-produced forages. Sheep require relatively little investment in buildings and equipment, with the exception of secure fencing to protect against predators and dogs.

## Types of Sheep

There are two types of sheep: meat (mutton) sheep are bred for the carcass quality of the young lambs; wool sheep are bred to produce a fine fleece. Meat breeds include Hampshire, Dorset, Shropshire, and Suffolk. Although all sheep produce wool, Fine Wool breeds of sheep, such as the Rambouillet, Merino; and Debouillet, produce a fleece of the highest market value. The beginning sheep farmer should choose one of the dual-purpose or crossbreeds that satisfactorily combine wool- and lamb-producing ability. Consult your Extension agent to determine the best breed or crossbreed for your situation and area.

## Feeding Sheep

Sheep on good pasture do not need grain during most of the year. An acre of high-quality improved pasture will carry approximately three ewes and their lambs. If sheep on pasture show signs of poor condition, such as unthriftiness, it generally means that the pasture is inadequate and the sheep need supplemental feeding. Renovation of old pasture land to improve forage quality will remedy this situation. When pasture is not available, particularly during the winter, sheep require a good quality legume hay, preferably alfalfa. Approximately 1 month before lambing, ewes should be fed 1/2 to 1 pound of grain a day in addition to the hay or pasture. Trace mineral salt and fresh water must be available at all times.

## Housing and Equipment

Sheep require minimal housing and equipment. A shed or old barn should be available for inclement weather and during lambing. Ewes with young lambs should be kept separate from the flock in an enclosed shelter for several days to ensure bonding between the ewe and lamb. A creep feeder can be built to provide grain for lambs as soon as they begin to eat. (A creep feeder is one that allows the young lambs, but not the older sheep, access to feed.) Other equipment that may be needed includes tail docking and castrating equipment, electric shears, hoof trimmers, and scales for weighing feed and lambs. The greatest expense to the beginning sheep farmer is probably the fencing necessary to keep predatory dogs out of the pastures. Sheep fencing recommendations can be obtained from your county Extension office or from a fence dealer.

## Reproduction in Sheep

The natural breeding time for most breeds of sheep is around the first frost in the fall. Certain breeds, such as Rambouillets and Dorsets, breed year-round. The gestation period for the ewe is 148 days, and the ram should be turned out with the flock in late summer for early-winter lambs. Early-winter lambs generally bring a higher price because of the limited supply and greater seasonal demand. Early to late winter lambs, however, require intensive management during the cold lambing season. To determine when and if the ewe has been bred, rams can be fitted with a marking harness that marks the ewe during breeding.

Estrus synchronization can be used to produce earlier lambs and to shorten the lambing season to approximately 2 weeks. This increases the amount of labor required during the breeding season. It will also increase the intensity but shorten the duration of the high labor period at the next lambing.

Pregnant ewes do well on good pasture as winter sets in. As the lambing season approaches, provide a mixed hay if pastures are depleted and start feeding a small amount (1/2 to 1 pound) of grain, such as corn, 1 to 2 weeks before lambing. Three to 4 weeks before lambing, the wool should be trimmed from between the rear legs and around the udder (a practice called crutching) and on the head if the wool is blocking the ewe's vision. Crutching allows for easy access to the udder by the lambs and also allows the manager to better evaluate the signs of impending labor. Lambing pens, which are usually 4 feet by 4 feet (larger for big ewes or twin lambs) and are equipped with a heat lamp, can be set up in advance. Ewes should be vaccinated against enterotoxemia (overeating disease) two weeks before lambing to provide protection for the young lambs through the colostrum.

Lambing involves the greatest amount of labor for the sheep owner. As lambing approaches, the ewes should be observed late at night and early in the morning for signs of labor, such as seclusion, straining, or bursting of the water bag. The ewes should not be placed in the lambing pens until after the lambs are delivered. Once labor begins, the lamb should arrive in 1/2 to 1 hour. Normal presentation of the lamb is with the forelegs forward and the head resting on or between the legs. If labor is longer, the ewe may need assistance from you or a veterinarian.

Once the lamb is born, it is important to be sure the ewe is mothering the lamb and that the lamb is nursing. The navel should be immersed in a tincture of iodine solution. Twenty-four hours after lambing, the lambs should have their tails docked, and ram lambs should be castrated. The ewe and lamb should be left in an individual pen for 2 to 3 days to facilitate bonding before they are returned to the flock. Lactating ewes require grain for milk supply, and lambs may be creep fed while nursing. It is usually economical to wean lambs at 2 months old.

## Sheep Flock Health and Management

A systematic approach to internal parasite control will minimize parasite problems. Most sheep in the humid Northeast, especially growing lambs, should be dewormed every month to 2 months. Dewormers are available in liquid, bolus, or paste form and can be administered by injection, by using a drenching gun or balling gun, or by placing paste directly into the mouth. Lambs should be vaccinated against tetanus and clostridial infections. Sanitation helps prevent many health problems, but tetanus antitoxin should be administered following docking and castration or other invasive procedures to provide protection against tetanus infection. If external parasites are a problem, the sheep must be dipped in or sprayed with an insecticide.

The sheep's feet should be trimmed twice a year to help prevent foot rot. Sheep are usually shorn before lambing or in the spring after the cold, wet weather has passed. If there is a custom shearer in the area, the owner of a small flock may find it easier to have the sheep custom shorn. Or the flock owner can buy electric shearers and do it himself. A good shearer takes the wool from the sheep in one piece. The fleeces must be stored in a clean, dry place until marketing.

## Marketing Sheep Products

There are several kinds of meat and wool markets for small-scale sheep producers, including markets for plain white wool, naturally dark colored wool, and freezer and market lambs. There is some speculation that the market for sheep's milk will grow, but at this time it is limited.

Lambs often can be sold directly to the consumer, especially among certain ethnic populations and during holiday periods such as Easter. Religious traditions and cultural habits help to promote a demand for lamb and mutton. Direct suppliers of freezer lambs may sell lambs at premium prices. Processing can be done on the farm if local regulations permit or at a local freezer-locker plant. Many freezer plants or processors have a butcher to prepare and package carcasses into the desired retail cuts. Arrangements also can be made with a local butcher to provide lambs for customers on special order. Slaughter lambs also can be sold through livestock auction markets or terminal markets.

## Cattle-Sheep Combination

There are economical and biological advantages to combining cattle and sheep on the part-time farm. Lamb prices tend to go up when cattle prices fall, and vice versa. Shared pastures work well: sheep tend to prefer finer plants, and cattle prefer the coarser ones, so co-grazing makes the best use of the total forage. Sheep also graze many common weeds even when good pasture is available while cattle usually avoid grazing weeds. There is less internal parasitic

infection in cattle and sheep when they are grazed together because parasites are not transmitted between cattle and sheep.

## Rabbits

Domestic rabbits can be raised by part-time farm operators on small acreage if there are no community regulations that restrict such an enterprise. The cash outlay for stock, housing, and equipment is modest. Rabbit meat is all white, fine grained, and high in protein. Only about 10 percent of the dressed carcass is bone, so the meat yield is high compared with that of many other meat animals.

### Rabbit Enterprises

Medium- to heavyweight breeds are best suited for home and commercial production of rabbit meat. Some of the popular breeds of heavyweight rabbits are New Zealand, American, Bevern, and Flemish Giants. Obtaining stock from a reliable breeder helps to ensure that the stock is healthy and productive.

Young rabbits (8 weeks old) or rabbits ready for breeding can be purchased. Young rabbits are less expensive but must be fed for about 4 months before production can begin.

### Reproduction in the Rabbit

The female rabbit (doe) is ready to breed at 6 or 7 months for medium breeds or 8 to 9 months for heavy breeds. Male rabbits (bucks) are reproductively mature at about 6 months old.

The gestation period of rabbits is 31 days. A good doe will raise 6 to 8 young per litter and can be rebred when the young are 5 to 6 weeks old. This makes it possible for her to produce four or five litters a year.

Young, mediumweight rabbits are ready to market when weaned at 2 months old, weighing about 4 pounds. A healthy doe can be expected to produce more than 100 pounds of marketable rabbits each year.

### Housing and Equipment

Rabbits are usually kept in hutches that are about 2 feet high, 2.5 feet deep, and 3 or 4 feet long. The hutches may have a mesh wire bottom for self-cleaning. Protective nest boxes can be built into the hutch. Hutches and nest boxes are easily constructed following plans available at your county Extension office. The hutches can be kept outside in the shade in areas where the weather is mild. If buildings are used to house the rabbit hutches, they must be adequately ventilated.

### Feeding Rabbits

A commercial rabbit feed, which contains all the necessary nutrients and roughage, is readily available in pellet

form. It takes about 4 pounds of feed to grow each pound of live fryer and to maintain a doe. Feed can be supplied by using a semiautomatic feed hopper. Feeding must be regulated to prevent the rabbits from becoming too heavy. A compressed salt and mineral block should be provided for the rabbits. Clean water must be available at all times; it can be provided by rabbit water bottles or an automatic watering system. Open bowls are not recommended for feeding or watering because they are easily soiled and tipped over.

### Marketing Rabbit Products

In addition to raising rabbits for the home supply, there may be a market in your area for rabbit meat, or the rabbits may be needed for research as laboratory animals. Rabbit pelts also have some market value, especially to local craftspeople. Sale of rabbits as breeding stock is an option if you are willing to maintain precise production records. Rabbit manure frequently can be sold as fertilizer.

Laws governing the sale of dressed rabbits vary according to State. Processing rabbits may require licensed and inspected facilities. You can get information on voluntary grading and inspection of rabbits from the Food Safety and Inspection Service, U.S. Department of Agriculture, Washington, DC.

If you want to produce rabbits for use by laboratories, hospitals, or health departments, determine the type, age, and size of animals the buyers want. Be sure to establish a market before going into production. A special license from the U.S. Department of Agriculture is required to sell rabbits to laboratories.

## Poultry

The poultry industry has become so mechanized and integrated that few part-time farmers can compete with large operators. However, 15 or 20 minutes a day spent taking care of a small flock will provide you with fresh eggs throughout the year. Surplus eggs find a ready market, and dressed poultry can supply a substantial part of your meat supply. Hens can be confined and require little land. A poultry enterprise on a part-time farm is well worth considering.

Although daily chores for the poultry flock are not as demanding as those for a dairy enterprise, time must be spent each day caring for the birds and collecting eggs.

### Egg Production Enterprises

Several breeds of chickens are suitable for small-farm flocks. The White Leghorn is primarily an egg-producing breed. To produce both eggs and meat, general purpose breeds such as Rhode Island Reds, New Hampshires, Plymouth Rocks, and crosses of these breeds are good choices. Chicks should be purchased from reputable hatch-

cries or breeders and should be tested for and free from pullorum and typhoid diseases. Most commercial hatcheries separate chicks by sex, so you can choose mostly females (pullets) for egg production or include some males (cockerels) to use for meat.

One way to start a flock is to purchase day-old chicks. Very young chicks require a great deal of care and must be kept in a heated brooder house. Older chicks that are well started or pullets almost ready to lay can also be purchased. Egg production birds such as the leghorn start to lay at 20 to 24 weeks; general purpose breeds begin laying at 22 to 24 weeks. With proper management, you can expect an annual egg production of 240 to 280 eggs per bird.

## Feeding the Poultry Flock

Feed is the greatest expense in egg production. Nutritionally complete, premixed starter, growing, and laying diets are commercially available in mash, pellet, or crumble form. This is the simplest way to provide balanced nutrition to the flock during various production stages. For maximum egg production, a balanced laying ration should make up the bulk of the diet for laying hens. Laying hens eat 85 to 115 pounds of mash a year.

## Housing and Equipment

Older birds can be kept in any building that keeps them dry, protects them from the cold, provides ample ventilation, and permits easy tending of the flock. Such buildings can be constructed inexpensively or remodeled from existing farm structures. Allow 3 to 4 square feet of floor per bird. Roosts should be 2 to 3 feet above the floor and 12 inches apart, allowing 6 inches per bird. A pit under the roosts will catch droppings and help keep the litter clean. A 6-inch layer of pine shavings, chopped corn cobs, or any other absorbent material is suitable litter for the floor of the poultry house or pen. Provide water in a container that the birds cannot soil or tip over; supply 5 gallons of water per 100 birds per day. Allot 4 linear inches of feeder space per bird.

A yard is unnecessary, but if you have one, it should be large enough to accommodate the birds without contaminating the soil. Fifteen square feet per bird is suggested.

## Poultry Health and Management

You can begin to ensure poultry health by purchasing birds from a reputable breeder or hatchery, one with a good disease control and prevention program. If the flock is kept in a spacious, clean, well-ventilated house, many of the diseases and parasites common to poultry can be avoided. Vaccines are available for certain poultry diseases-check with your veterinarian or county Extension agent for recommendations. Birds should be sprayed for mites and lice, and facilities and equipment should be cleaned regularly and disinfected before a new flock is brought in. Watch the

flock for any signs of sickness and act promptly when illness occurs. Ill birds should be isolated from the rest of the flock. The State diagnostic lab can assist in cases of chronic disease. Very sick birds must be killed and burned or buried deeply to prevent the spread of the disease.

Eggs should be gathered twice daily and cleaned and cooled. Eggs can be held at temperatures between 45 and 55 °F. Under suitable holding conditions, they will retain their quality for 2 to 3 weeks and longer.

## Marketing Eggs

You may sell eggs directly to consumers, but you should check local or State regulations before doing so. Fresh eggs are often sold at roadside stands and farmer's markets. If you have more than 3,000 birds and sell to retail stores, bakeries, or restaurants, you are subject to Federal sanitation and other requirements.

## Meat Bird Enterprises

The requirements for raising poultry for meat production are similar to those for egg production. Health and sanitation are important to the success of a poultry flock. The birds require daily care, and appropriate feed must be purchased. Odor and waste disposal require attention. Unless you are a subcontractor, the number of birds that you may market without Federal inspection is limited. Birds require shelter and are susceptible to predators. If adequate building facilities are available, labor and capital requirements are low.

## Types of Meat Birds

There are several types of meat birds. Capons, broilers, and roasters are the most popular. Turkeys, ducks, geese, guineas, and game birds are other meat bird options. Further information on each of these enterprises is available through your county Extension office.

## Limitations

Adverse weather conditions, predators, or poor management can turn a potential profit into a loss in a short time. Explore markets or outlets for meat birds before you begin production.

## Goats

Goats are often kept on the part-time farm for 4-H or FFA projects or as pets. They also may be kept to produce meat (chevon), milk, and fiber (angora, cashmere, and mohair). More Americans are including chevon in their diet, especially among certain ethnic populations. Goat's milk can be tolerated by infants and by people who are allergic to cow's milk and can be used in cheesemaking.

The labor, equipment, and facilities required to operate a dairy goat herd may make it an unfeasible operation for

the part-time farmer. Markets for goat meat and fiber should be explored before attempting production. There are many different breeds of goats. Do some research to determine which breed or cross is suitable for your area and purpose.

## Feeding Goats

Goats are browsers as well as grazers. They are more selective in foraging than sheep and cattle and therefore may require greater or closer nutritional management. Attention to pasture and forage quality and availability will help reduce grain costs. If the animals are receiving plenty of high-quality forage, 1/2 to 1 pound of grain per day should be ample for growing kids, dry does, and bucks. Does in mid- to late-gestation and lactating does may require more grain. The amount needed depends on the amount and quality of the forages consumed and the level of milk production.

## Goat Housing and Equipment

Goats do not require any special housing, but they do need protection from rain, snow, wind, and cold. Outside lots should have at least 25 square feet per goat. Bucks should be separated from does.

Goats are natural climbers and will climb on low buildings and machinery if not confined or tethered. They also tend to be destructive and will nibble on everything from electrical outlets and cords to windshield wipers. Mature goats can raise themselves on their hind legs to reach heights over 6 feet. Goats will rub, climb, play with, and push against fencing and gates. Care must be taken when designing enclosures and shelters to avoid injury and property damage.

## Reproduction in Goats

The breeding season for goats is September to January. Does are in heat for 1 to 2 days, and the length between heats is about 21 days. Gestation averages 149 days or about 5 months. Does usually have two kids but may sometimes have three or four.

## Goat Herd Health and Management

Goats should be obtained from a reputable source and must be tuberculosis and brucellosis free. A herd health program for goats includes regular deworming for internal parasites, vaccinations, and observation for lice, ringworm, and pinkeye, with treatment if necessary. Goats' feet should be trimmed twice a year to help prevent foot rot. Goats must be naturally polled or dehorned to prevent injuries.

## Marketing Goat Products

The market outlets for goat products are similar to those for sheep. Market alternatives include livestock auctions or a local slaughterhouse or butcher for a direct-to-consumer product. It is important to determine and establish the markets for your product before you begin production.

## Swine

Swine are not widely recommended for the part-time farm operation. Raising swine is a confining operation and requires more management than raising cattle, sheep, or goats. Hogs require a greater investment in housing, shelter, and fencing, and since they cannot utilize forage, they incur greater feeding costs. Some communities have ordinances that prohibit keeping swine. It may be profitable to raise one or two pigs for the family meat supply if you can use surplus garden produce.

## Types of Swine Enterprises

There are several enterprise options in raising hogs. A herd of sows can be bred to produce two litters a year. The young pigs can be sold as feeders at 40 to 60 pounds or finished out to 210- to 225-pound market weights. Producing just one litter a year on pasture during warm weather eliminates the need for a heated farrowing house but also diminishes potential returns.

Market hogs can be produced in conjunction with a sow operation or as a separate enterprise. Purchasing healthy feeder pigs eliminates the need to manage the sow and the intense labor of farrowing. Raising market hogs from feeders is a low-risk, low-labor enterprise with fairly rapid cash turnover from purchase to sale. Although sows can use a limited amount of pasture and silage, the majority of the feed for market hogs must be in the form of grain, which is usually more expensive than forages.

## Housing, Equipment, and Herd Health

Hogs should be provided with a clean, dry dwelling, well ventilated but not drafty. When confined, pigs up to 60 pounds require 3 to 4 square feet of floor space each. If outside lots are used, a minimum of 4 square feet outside area per pig, plus a 3 to 4 square foot bedded sleeping area, is required. Feeder and waterer space must be provided for the pigs.

Insect, parasite, and disease problems in hogs are controlled with the use of sprays, dewormers, and vaccinations. Odors from waste material can be offensive, and manure disposal should be planned before you invest in a swine operation.

## Marketing Swine

Market hogs must be weighed periodically and should be marketed when they reach 225 pounds. Beyond this

weight, feed conversion suffers, and feed costs increase rapidly. A reliable scale is important for the hog producer. Market outlets for hogs are similar to those available for cattle, sheep, and goats.

## Dairy Cattle

Dairying is not compatible with part-time farming. Dairy cows require intensive management, an inflexible daily labor schedule, and a high per-unit capital investment. In addition, milk and milk products are highly regulated and must comply with stringent health regulations.

The part-time farmer may want to keep a dairy cow to furnish milk and milk products for the farm family. Keeping a dairy cow on the part-time farm is practical only if ample pasture and hay are available, breeding services are offered locally, and a comfortable and sanitary shelter can be provided. The dairy cow needs to be milked twice a day; someone in the family must be on hand every day to milk, feed, and water the cow. The average dairy cow produces more than 10,000 pounds of milk a year. If the family cannot use the milk and milk products, feeding and caring for the cow may be impractical.

## Exotic Livestock

Exotic species are animals not generally associated with traditional farming. These include bison, reindeer, elk, llama, red or fallow deer, and ostriches, as well as others. In exotic species, breeding stock becomes the focus of attention rather than the production of animal products.

Most of these species have unique management requirements, and the initial capital investment for breeding stock and specialized equipment, such as fencing, may be extremely high. For further information on these animal enterprises, contact your local Extension office.

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