

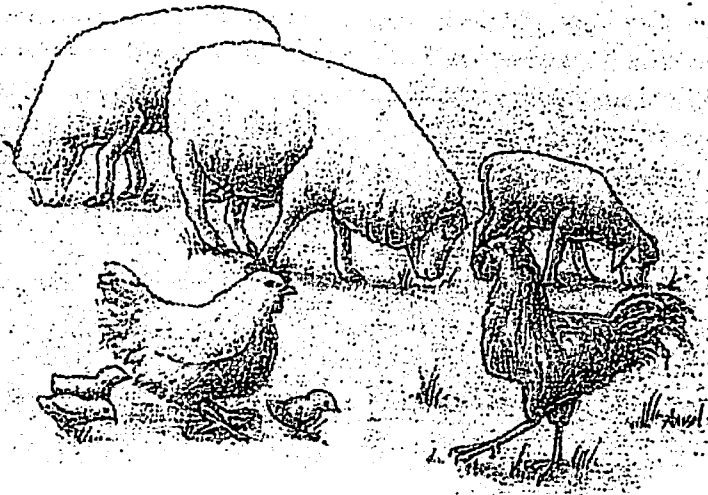
## LIVESTOCK

ONE WAY TO DIVERSIFY THE FARM'S POTENTIAL MARKETING OPTIONS AND simultaneously improve soil fertility for vegetable crops is to include livestock in your system. Because adding livestock to the farm can increase the management load considerably, you should not acquire livestock until the basic vegetable-growing operation is firmly established. Even then, a lot of thought must be given to the added hours of work and the possible need for extra workers.

If you feel comfortable taking on these new responsibilities, the addition of livestock is the next logical step in enhancing your farm's stability and economic independence. Livestock can be considered as a part of the crop-rotation plan or as a separate operation altogether.

### *Free Manure*

Many vegetable growers keep livestock separate from the rotation, using mainly purchased feed for their farm animals. The stock are not usually kept for profit, but rather as a source of free manure. For example, if the farm has barn space, you might decide to raise dairy bull calves to beef market weight on purchased



hay and grain. As a supplementary farm activity this is not likely to yield a profit per se. The costs will likely equal the income from selling the animals. But the profitability must be calculated from the savings gained by not having to purchase manure, and the further benefit of having the quantity and quality of manure you need, produced right on the farm.

### *Horses*

From my experience with different manures as fertilizers for vegetable growing, I would recommend horses over cattle. If the facilities were available I would choose to board horses for the winter. In many ways this may be a simpler option. First of all, winter is the slackest time in the vegetable grower's year, and the livestock responsibility would not be continued through the busier half of the year. Second, I could charge enough to feed the horses well and bed them on straw to produce a quality manure-straw mixture. Lastly, even if my return from the operation were only enough to cover expenses (I could thereby underbid other horse boarders to get the number of animals I desired), I would have produced, at no cost, a year's supply of what was long considered to be the ideal soil amendment for general vegetable crops: horse manure and straw bedding. This fibrous horse manure-straw combination has been a reliable fertilizer throughout the history of market gardening.

The size of the livestock operation can be calculated according to the farm's manure requirements. In order to manure half the acreage every year at the rate of 20 tons per acre, a 5-acre operation would need 50 tons of manure. Since a horse will produce 15 tons of manure (with bedding) per year, that would equal .066 horse per ton. For a six-month boarding operation, that factor must be doubled to .133; .133 horse per ton of manure x 50 tons = 6.65 (call it 7) horses. Boarding seven horses bedded on straw for six months would give you 50 tons of first-class vegetable fertilizer.

### *Managing the Manure*

There would be one problem to contend with, however. On the scale of production we are considering, the grower would be faced with a great deal of work managing that manure properly (by composting it) and spreading it on the field. However, if the stalls were cleaned every day and the manure added to a steadily growing compost windrow, the composting part would be manageable. Spreading that quantity of manure is a more formidable task. I have spread 50 tons of manure by hand in a year, and I've done it for many years of vegetable growing.

Yes, it is hard work, but certainly not beyond the ability of most people. It is usually accomplished over a period of time, and in retrospect it is not all that difficult.

I will agree that spreading 50 tons of manure would be a lot easier with some machinery. Since I don't believe you can economically justify the expense of a tractor and front-end loader on a 5-acre farm, the best solution is to hire a custom operator. The difficulty, of course, is to find someone who can do the job when you need it done. If that can be arranged, hired machinery would be a viable solution.

### *Rotating Livestock and Crops*

As I said, were I to operate such a program, I would choose horses. But there are other considerations which convince me that the first option, including livestock in the rotation, may be a better solution for the following reasons:

- Small livestock products such as fresh eggs or range-fed poultry can be valuable as a means of attracting and keeping customers for the vegetable operation. The livestock/soil-fertility combination will then contribute directly to farm income.
- The winter months are the outdoor grower's only opportunity for vacation. I guarantee that most people will be more effective during the rest of the year if they take some time off then.
- The ideal soil structure and organic matter benefits conferred by adding manure to the soil can also be achieved by growing a mixed legume-grass sod for two or three years.

Fortunately, there is a livestock choice that will make optimum use of a legume-grass sod, provide a readily saleable item, not require winter care, and effectively produce manure and spread it for you in the process.

### *Poultry*

The best livestock to complement vegetable production are poultry ranged on sod in the rotation. Chickens or turkeys thrive when run on shortgrass pasture, known as "range." According to varying experience, pasture can provide up to 40 percent of their food needs. In this option poultry are grazed on a green manure crop that is included in the crop rotation. In that way the legume or grass crop grown for soil improvement also feeds the livestock and they, in turn, manure the field.

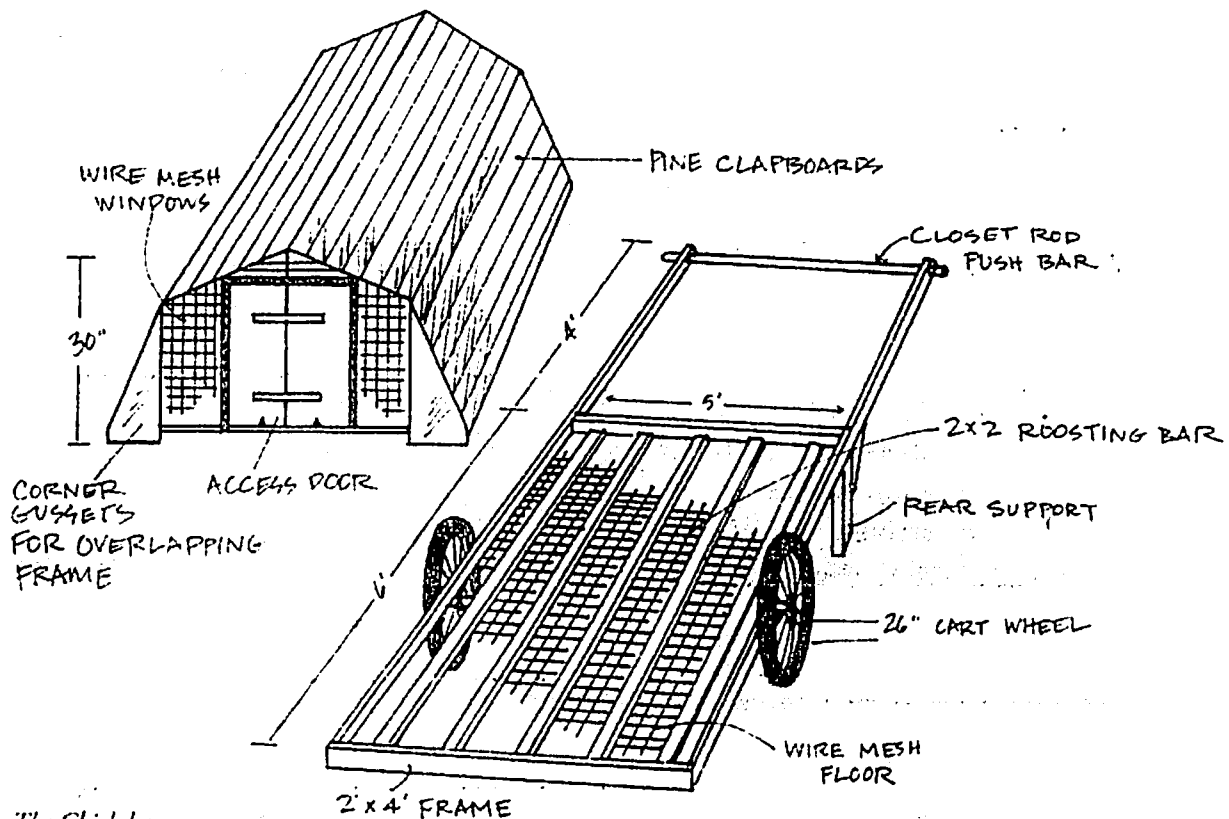
Studies show that grazing a green manure results in higher soil fertility than an identical green manure that was mowed with the clippings left in place. There is a significant soil-fertility benefit from the biological activity of animal manure, even though its ingredients came from the field itself and some nutrients were actually removed by the livestock. If grazing is supplemented by feeds purchased off the farm, the fertility gain will be even greater. On average, 75 percent of the fertilizer value of the feed consumed is returned to the soil in manure.

Poultry on range thrive best when the grass is kept short and succulent, a stage at which it is also highest in protein. Grass can be kept short by mowing, at the cost of time and fuel, or by grazing sheep at little expense. Determining the ideal ratio of sheep to poultry to pasture acreage requires some observation and experience on the grower's part. It usually falls somewhere around four sheep and 200 chickens (or 50 turkeys) per acre, depending on the size and breed of stock and the productive capacity of the soil. Overstocking causes crowding and bare spots and should be avoided. You can always mow a little, if necessary. The first requirement in this range system is for some sort of movable poultry house.

### *The Chicksha*

There are many ways to house poultry on range. Range-rearing systems were used extensively prior to the 1950s, and many styles of shelter were devised. When we began with range poultry, we modified those early designs to make the houses smaller and lighter so they could be moved without a tractor. We also built them with larger wheels for easier rolling. This design was instantly christened "the chicksha." We built them 5 feet wide by 6 feet long and 30 inches high at the center. This height is more than sufficient for the chickens and allows for a heat lamp to be mounted inside the house during the brooding period. This size is large enough for 50 birds per house, since they are only kept in there at night for protection against predators.

The walls and roofs were made of a single layer of overlapping pine clapboards. The floors were made of 1/2-inch mesh hardware cloth so the manure could fall through at night. (Each morning the house was rolled to a new site on the pasture.) The same mesh material was used for windows to let air in. When young chicks were being started in the chicksha, the floor was covered with wood chips and the windows with plastic to keep the interior warmer. Low roost bars were added to the floor when raising layers. The houses were built in two parts—the undercarriage and the superstructure—so they could be taken apart for cleaning. The houses were strong, the management was efficient, and the chickens thrived in them.



*The Chicksha.*  
 Its door, hinged at the bottom, becomes the entry ramp when open.

It was the new, woven electric-mesh sheep fences that allowed us to make the next design innovation. The right models provide secure predator protection. They need to be 4 feet high to deter coyotes and foxes. Since this means that the nighttime predator protection is now separate from the house, we can build the house from very light materials. Our present field houses are larger and lighter than anything before and house 300 birds. They are also much less expensive. Because an electric fence provides predator protection from skunks, coons, foxes, and dogs, all the house has to provide is shelter. So what we did was to convert one of our plant-growing tunnels into a poultry shelter. The present design is basically a movable greenhouse for poultry.

### *The Hoop Coop*

The hoop coop, as our solar hen house has come to be called, consists of a sliding base frame and a hoop superstructure covered with plastic. It is anchored to the ground with a short length of rebar driven in at each corner.

The base for the 12 by 20-foot coop consists of a pair of parallel 20-foot-long pipes or 2 x 6s set on their edges. The ends are beveled so they slide along the ground.

The superstructure is made of 20-foot lengths of fiberglass rod (it could be metal or plastic pipe) bowed into hoops the same as for the field tunnels described in Chapter 21. The hoops are erected every 4 feet into holes drilled in the upper edge of the 2 x 6 runners. The hoops are covered with a single layer of plastic.

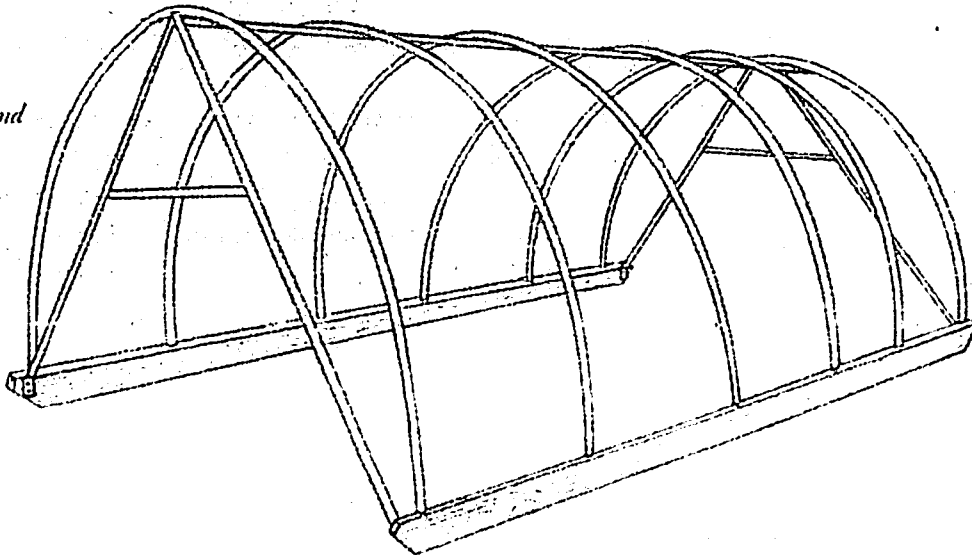
The doors are framed at both ends. The door frames hold the sides of the coops apart. The door shape is triangular, rather than rectangular, for greater strength. These triangular door frames are best made of metal pipe welded together in the shape of an A.

After the hoops are erected, the plastic covering is put on and attached tightly to the baseboards. The plastic is held on with narrow lath strips as described for covering greenhouses.

The ends of the plastic are attached to the door frame. To do this, you can employ either the plastic inserts used around the edges of the greenhouse vents or sections of rubber pipe or hose slit lengthwise, so they can be opened up enough to slide over the A-frame pipes and hold the plastic to them tightly. The door material (composed of the same plastic covering) extends from one side of the A-frame and closes diagonally.

In the midsummer heat, two options will keep the house cooler. An opaque

*The hoop coop  
(12 feet in width and  
20 feet in length).*



white plastic can be used instead of the clear plastic, but at the expense of losing some of the early-season heat gain. Or greenhouse shade-cloth can be stretched over a clear plastic to block the sun. The shade cloth mesh also serves to protect the plastic from other livestock when they graze with the poultry. The hoop coop offers the following management benefits in conjunction with a range-poultry system:

**Low Initial Cost.** The two 20-foot-long pipes or 2 x 6s for the base frame and the welded metal door frames are the only special components. The fiberglass rods for the hoops are the same as those used for a 12-foot-wide field tunnel. The only continuing expense is the yearly replacement of the plastic cover.

**Mobility.** This house can be used on a wide variety of terrain. The house should be moved to a clean site every day. The A-frame door design allows moving even with poultry inside because there are no crossbars at ground level. The house is moved by means of a rope or chain attached to the runners. If the fiberglass hoops are reinforced with a ridge purlin like the field tunnels, then feeders can be hung from the hoop frame and thus will move with the house. Waterers and any outside range feeders will have to be moved separately, but that can be done every other day.

**Cleanliness.** The house itself is easy to clean because there is so little structure involved. The 6-mil plastic covering should be replaced after each season. The ground underneath and around the house is changed daily. All crops and livestock benefit from a rotation where they are moved to new ground periodically. A movable chicken house prevents the buildup of disease and parasites in the environs of the shelter, which never spends too long in one place.

**Flexibility.** We have used this design for range poultry from start to finish. The house is intended to be the only shelter necessary from the day the chicks arrive. When used for starting baby chicks, the grass upon which the house sits should be mowed very short. Ventilation is managed by adjusting the door coverings. With the doors rolled down and a brooder hung inside, the atmosphere is warm enough for starting baby chicks once outdoor temperatures are over 50°F. (10°C.).

**Simpler Feed.** Studies have shown that poultry on good range will grow well on just whole grains and mineral supplements without the need for the complicated feed mixtures fed to birds raised in confinement.\* The grass, worms, and insects provide extra protein, plus all the known and unknown ancillary feed factors. This can result in a savings of up to 40 percent in feed costs. If desired, the poultry diet can be supplemented from the garden with trimmings or unsold crops.

\*Jim Worthington,  
Natural Poultry-Keeping  
(London: Lockwood,  
1970).

**Less Work.** This is one poultry house that doesn't need to be shoveled out; whether day or night droppings fall onto the pasture. Since the house is moved to a new location every day, the manure ends up being spread lightly and evenly across the range. When poultry are grazed with other livestock, bird-scratching helps to incorporate all the manures into the soil. Scratching also benefits the pasture by aerating the surface of the soil and encouraging the growth of the finer grasses.

**Better Health.** Grass, insects, and outdoor living contribute greatly to the health of the poultry. Pasture has long been recognized as one of the most important guarantees of poultry health. Poultry raised on range do not need to be protected with drugs and medications like those raised in confinement.

**Better Flavor.** And do they ever taste better! I have yet to meet anyone who doesn't notice the difference. There is no meat or dairy product that the consumer associates more with poor flavor and overmedicated treatment than poultry. When they are raised on clean grass range, the improvement is so considerable it almost seems like the meat of a superior species. Growers who can provide the market with range-fed birds will find customers beating a path to their door.

### *Hoop-Coop Chicks*

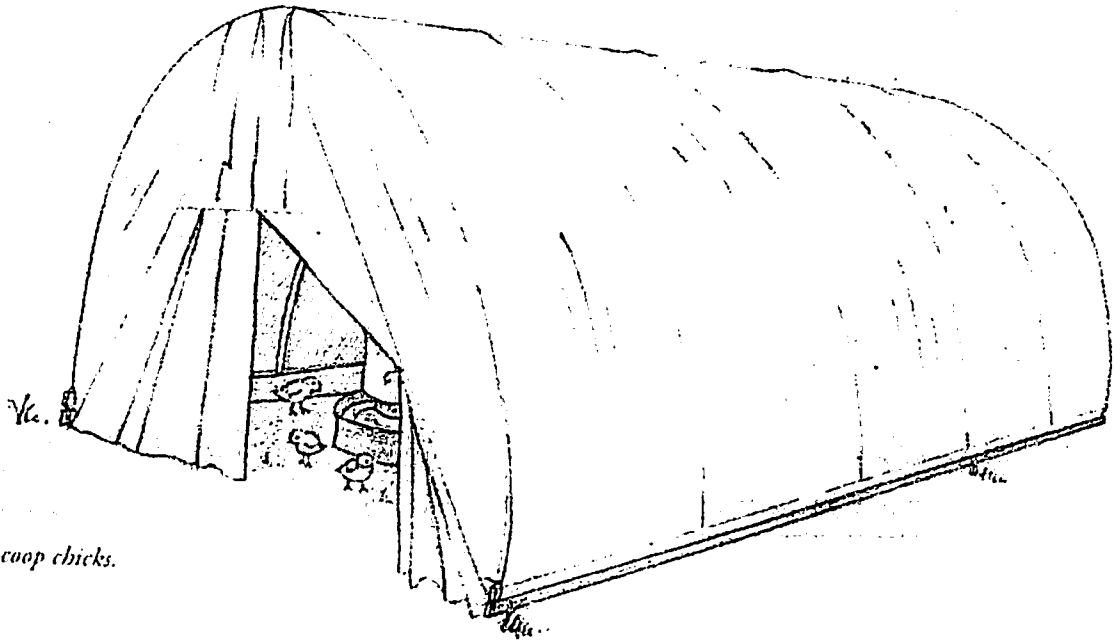
Poultry are purchased as day-old chicks, or poults, and are housed right from the start in the hoop coop. A brooder lamp or a floor brooder is placed in the house for warmth. (Specific details about temperature and feeding needs for baby poultry can be found in many books, extension pamphlets, or from the poultry supplier.) In colder weather chicks can be started indoors, then moved to the hoop coop when the weather warms up. Or you could provide supplementary heat in the hoop coop.

There are advantages to starting in the range house. First, the chicks identify with the house and will return to it for shelter after they are let out on pasture. Second, the hoop coop allows them to have that important early access to grass. The very earliest grass area for chicks should be clean ground that has not been grazed by poultry for the past few years. That is one of the advantages of incorporating poultry into a crop-rotation system where clean, new ground can be assured.

When poultry are on pasture, a simple but specific management schedule should be followed: in the morning sprinkle scratch feed, pull the rebar anchors, move the house a short distance, and drive in the anchors again; in the evening refill the feeders and waterers. Feed can be provided inside from hanging feeders

*\*My baby chicks on range have never been bothered by owls or hawks. But if that is a problem where you live, you will want to use covered pens. There are excellent designs in Joel Salatin's Pastured Poultry Profits (Swoope, VA: Polyface, Inc., 1993). This exceptional book also contains extensive material on feeding, slaughtering, and marketing. The author is a specialist on range poultry, and his information is very sound.*





*Hoop-coop chicks.*

or outside from range feeders. Each has its advantages. The inside hanging feeder is moved automatically when the house is moved. The large, covered, outside range feeder holds more feed and needs refilling less often. The waterers are usually set outside the hoop coop and moved periodically.

### *Poultry Plus Sheep*

As mentioned earlier, poultry on range do best when the grass is kept short. Closely clipped pasturage is higher in protein and easier to digest. To keep the grass short, either mow it from time to time or graze it with animals. Sheep will do it best. To avoid year-round livestock care, sheep should be purchased as lambs in the spring, grazed during the poultry season, and sold at the end of the year. There is not much profit here; money saved in mowing time and expense is the principal return.

When poultry are on pasture with other stock, the feed should be available from inside the range house where the other stock cannot get at it. A few bars across the A-frame door will keep the sheep out of the house. A range feeder is no proof against hungry sheep, who will often knock it over and spill it, even if it is redesigned to make access more difficult for larger animals.

### *Fencing*

The same predator-proof, woven electro-plastic netting serves for both poultry and sheep. The simplest electric source is one of the battery-powered fence chargers. Since these fencing systems are extremely portable, the fence can follow the hoop coop to all parts of the farm. This allows any small or odd-shaped piece of the property, even lawns or brushy areas, to be grazed periodically.

### *Breeds*

With sheep, you can use whichever breed is locally available. However, downland breeds, which are more pure grazers than part-browsing, upland breeds, may be the best bet. With turkeys, the smaller varieties are usually better rangers than the larger ones. Of the large turkeys, the bronze are better foragers than the white, in my experience. With chickens, breed is a difficult but important choice. Certain commercially popular broiler crosses, such as the Rock Cornish, may not be the best. Their nutritional requirements are so specific due to their rapid growth that they must be fed high-protein commercial feeds. Although they do well on range as long as those feeds are used, there are few savings in feed costs because they don't take advantage of the pasture.

The most desirable chicken breeds for this system are active foragers. Their only disadvantage is that, although they are a perfectly nice bird, they don't provide the unbelievably plump carcasses of the hybrid broiler crosses. If those carcasses are what the market wants, then a grower will have to try out the different hybrid strains to see which one is most adaptable. We have found the Barred Rock cross to be quite successful. For those interested in the older breeds, I recommend White Rocks, Dark Cornish, and Mottled Houdans. All of these breeds thrive on range plus a simple diet and reach market size at 12 to 16 weeks. The last two breeds are especially adapted to ranging and provide an ideal product for a market that appreciates the best in gourmet chicken.