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Use this document in conjunction with the companion website:

Links for New Farmers
http://www.ctahr.hawaii.edu/sustainag/newFarmer/links.asp

hosted by the Sustainable Agriculture Program at the University of Hawaii College of Tropical Agriculture and Human Resources. Extensive additional information and updates are posted there.
ANIMAL PRODUCTION

With each wave of immigrants to reach these remote islands, people have brought with them their favorite beasts. Whether pigs transported in Polynesian voyaging canoes, black longhorn cattle or axis deer gifted to King Kamehameha, or domesticated sheep and goats introduced by European settlers, most of these animals are now part of our local culture, history and economy. Some of these “buggahs” have escaped from their pens and become environmental terrors ~ but more on that in chapter 4. The fact remains, we like our animals. Every day the peoples of Hawaii eat and use products derived from these animals. Some are even able to manage their livestock in ways which help reduce human drudgery.

On the farm or within a grassland ecosystem, plants and animals tend to complement each other. Ruminants (such as cattle, sheep, and goats) can convert plant fiber which is indigestible to humans, into meat, milk, wool, and other valuable products. Domesticated birds scavenge for insect delicacies, reducing insect pest pressures on crops. Animal manure fertilizes and increases organic matter within the soil, restoring nutrients into the crop or pasture system. Some innovative farmers have their animals to do their dirty work – using pigs to turn compost or ducks to clip weeds. The art and science of managing these plant and animal interactions is a big challenge for any new farmer to learn.

IS THIS REALLY FOR YOU?

Unlike crop production where a plant can be ignored for a while without mishap, caring for livestock is a 365 day-a-year job requiring a much higher investment of time. Before starting your livestock enterprise, you’ll need to do extensive research. Be sure to investigate the following issues before you make your final decision about getting into the business.

Legal Restrictions: First determine if your property is zoned to allow domestic livestock agriculture. Generally you can find this information at your county planning department. Learn about other regulations which affect your livestock operation such as required legal setbacks to dwellings and wells, restrictions for barns and fencing, and nuisance laws regulating noise, dust, odor or flies.

Feed: Understand the nutritional needs of the animals you want to raise. This will differ greatly from one animal to another based on their size and digestive systems. Food requirements also vary due to climate, the time of year, and the production stage of the animal (growing, breeding, pregnant, lactating, dry).

Your decision about which animals to raise will partly be based on the volume of feed they will consume. You’ll need to assess

HAWAII’S PANIOLO: A PROUD CULTURE

The first cattle arrived in Hawaii in 1793, a gift of five longhorns to King Kamehameha I delivered to the Big Island of Hawaii. The King placed a taboo on slaughtering the cattle and they thrived. By 1832 wild cattle had grown too numerous, becoming a problem. King Kamehameha III arranged to have three Mexican cowboys come to help thin the herds. Hawaiians quickly learned from the Mexican cowboys how to ride horses, rope and tame the wild cattle, becoming known as “paniolos.” When Waimea’s Ikua Purdy won the World Rodeo Championship in 1908, the Hawaiian paniolo received world wide recognition for their skills. The slack key guitar style was also created by the Hawaiian paniolos.
Choosing the Road Less Traveled

your ability to pay for feed or to produce it.

Generally, feed is purchased or cut and fed. In Hawaii, transportation costs tend to make feed costs higher than for mainland competitors. Get a good handle on what your feed costs will be and how they will vary before getting into this business.

If you have access to land, forage from pasture or from orchard groundcover may be an option available for grazing livestock. Several factors determine how much forage the land can produce – climate, topography, soil type and fertility, irrigation availability, and the grazing management system which you use. Pastures can be improved through fertilization, weed control, pasture renovation and reseeding. Consult with your local Cooperative Extension agent to determine how much forage your land can produce. Consider selecting breeds best adapted to your climate and grazing system.

Although most ranchers employ continuous grazing systems, there is another management option known as rotational grazing. In this system, pastures are subdivided into paddocks and animals are moved through these paddocks at frequent intervals, allowing them access to a limited pasture area for a short period of time. This idea is being adapted to other species as well, engendering a market for “pastured” pigs and poultry.

Water Supply: Project how much water your livestock will need, realizing that their water requirements will vary by species, breed, animal age, time of year, and climate. Research and plan how you will get them water.

Some options may include:

Hauled water: This can work well for rotational grazing schemes. Move the water source within the pasture to distribute animal damage and manure.

Pipeline systems: A pumping system can be solar, wind, gas/diesel powered or gravity-fed to troughs and tanks. Animal operated pumps (such as nose pumps and nipple waterers) are also available.

Stream or Pond: Livestock tend to damage stream banks with their hooves, defecate in the water, and consume streamside plants. To protect riparian areas, control and limit livestock access to streams and build a stable (gravel) livestock access area. (USDA cost sharing funds are generally available for stream protection measures.)

Springs: If there is a spring on the property, determine if you are legally allowed to use it for a livestock water supply. Test the water to check for contamination.

Shelter: Animals require housing to provide shade and to protect them from wind and rain. These structures range from modest simple pole structures to full-scale styled barns. Portable shelters

Monogastric animals (pig, fish, dog) must consume high quality balanced diets. Swine need a high energy, concentrated grain diet low in fiber (cellulose) and supplemented with adequate protein. The avian monogastric digestive system (poultry) differs because they have no teeth. Feed rations will vary for meat or egg production.

Nonruminant herbivores (horse, rabbit, guinea pig, hamster) need less roughage, more and higher quality protein and added vitamins.

Ruminants (cows, goats, sheep, elk, deer, bison, llamas and alpacas) have complex multi-chambered stomachs with microorganisms in the chambers which convert cellulose into energy. They can process large quantities of bulky forages to provide their nutrients.
are very practical for avoiding buildup of manure and urine and in rotational grazing systems. Before you build, take into consideration installation, cost, appearance, longevity, and maintenance factors. Standard plans for livestock shelters are available for purchase and on-line.

**Space:** Determine the space requirements of the animals you plan to raise. If you need to erect fencing, consider the advantages and disadvantages of each kind of fencing, installation, cost, appearance, safety, longevity, and maintenance issues.

**Health Care:** Consult a local veterinarian to understand the health care requirements and expenses for your livestock. Be aware that internal and external parasites pose a serious concern in the tropics and sub-tropics. Establish an antihelminthc program for your livestock. Health care also includes preventative measures such as proper nutrition, maintaining vaccinations, record-keeping, and quarantining new animals. Become informed about local toxic weeds which can harm your animals.

**Predator Control:** Sheep and goats are vulnerable to dog predation. Poultry and waterfowl are subject to predation by cats, mongoose, owls and hawks. A good perimeter fence line will protect your livestock. In some cases an additional low electric fence may be required to prevent dogs from digging below the main fence.

**Manure:** One of the most time consuming aspects of livestock production, manure management, is the single aspect of your operation most likely draw complaints. If you’re not familiar with this aspect of animal husbandry, it’s hard to imagine ahead of time just how much manure you’ll be handling. Before going any further with your plans, work with local agricultural professionals to develop a good estimate of how much manure your new livestock operation will produce.

Good manure management will keep your livestock healthy, return nutrients to the soil, improve pastures and cropland, and protect the environment. Poor manure management will increase insect and parasite populations that can get your livestock sick and will generate angry phone calls from your neighbors. Part of the nutrient and bacterial contamination observed in Hawaii’s surface and ground water can be traced to inadequate manure management.

You will need to address how to collect, store, remove and/or apply manure. The Cooperative Extension Service and the USDA Natural Resources Conservation Service have extensive resources and information about manure management options. Many farmers use their manure on-site to improve soil fertility. New partnerships are emerging between livestock and crop producers to recycle surplus manures back to neighboring farm fields. Also there is a growing market for composted manure by gardeners, landscapers and farmers.

**Composting** may be an excellent option for managing your manure. A good composting operation will reduce the volume of
manure, kill parasites, reduce odor, and result in an excellent soil amendment. Since composting is a biological process which relies on living microorganisms, you’ll need to learn how to manage compost piles to obtain optimal temperatures, correct carbon to nitrogen ratios, and adequate oxygen and moisture content. Sales of a high quality compost product can help you generate revenue from a waste product.

On-farm Processing and Slaughterhouses: Before you enter this business, it’s best to consider your slaughterhouse and processing options early on. Often it’s difficult to locate commercial processors that handle small numbers of animals. If you don’t get too queasy about the thought of killing, plucking, skinning and gutting, on-farm processing may be an option. Be aware that there are strict federal processing regulations. Small independent producers may be exempt from federal inspection rules – but be sure you do your research ahead of time. Designs for small on-farm abattoirs and mobile abattoirs are available.

STARTING SMALL

If you haven’t worked with animals, a new farmer should begin with a small scale facility and gain some experience with smaller animals which are generally less expensive to purchase and require less space to manage. Additional sources of information about raising these animals are available at the end of this chapter.

POULTRY

The low investment and small area required to raise a flock of domestic poultry makes this a sound venture for the beginning farmer. Domestic poultry can supplement the family menu, as well as generate several niche products. For example, producers can sell free-range or organic meat and eggs, brown eggs, live birds for ethnic markets, and birds for hobby and leisure.

Pastured poultry (or free-range poultry) is a growing niche market that taps into consumer demand for more natural and humanely raised protein sources. Consumers who purchase this poultry product are generally willing to pay more for the system that includes raising poultry on grassy pasture. The product is considered by many consumers to be healthier and tastier, as well as more environmentally sound.

Another growing niche market is for “designer eggs” – eggs with higher concentrations of vitamin E or Omega-3 fatty acids. By modifying the diet of laying hens, farmers can produce eggs that contain significantly more Vitamin E and omega-3 fatty acids than ordinary eggs. “Free range” and “organic” eggs are also enjoying growing popularity.

SWINE

You can’t have a lu’au without a pig. The “pua’a” (Hawaiian for pig) has both traditional and contemporary value within Hawaiian culture (as well as within other Pacific and Asian cultures of Hawaii). Chinese and Hawaiians demand “hot pork” killed within
12 hours for its flavor. Local production for swine cannot meet the current demand so Hawaii imports most of its pork.

Raising swine on the small farm (3-5 acres) is common in Hawaii and fairly easy to do. Pigs can be fed imported feed or food, but they are most valuable for recycling food and agricultural waste products (such as food scraps and cull macadamia nuts, fruits and vegetables). To avoid odor complaints, consider using a deep litter system which has worked well in Hawaii and the Pacific.

**RABBITS**
With a minimum investment, relatively limited space, and a modest investment of labor, beginning farmers can start raising rabbits for meat and for the pet market. In Hawaii, locally raised rabbit meat can be found at grocery stores. Pet rabbits are especially popular around Easter and Christmas.

**GOATS**
In Hawaii there is a market for goat meat within the Filipino community. Other ethnic groups celebrate weddings and commemorate religious feasts with goat meat. All locally produced goat milk and cheese products are currently being sold, primarily as high value products to hotels.

**HORSES**
While it is not uncommon for farmers to keep a few horses, they are usually pets and used for pleasure or more recently for ag tourism. Some innovative farmers may board or breed pet horses, exotic horses, work horses, miniature horses or race horses.

**CATTLE**
Beef or dairy cows may be kept on farm for family use or for income. Today’s paniolo may also work with special breeds of cattle being introduced for new niche markets. Belgian blues, huge animals with good meat flavor and leanness are now being raised on the Hawaiian range. Smaller breeds such as the Dexter can also be found.

The beef and dairy industries in Hawaii are very competitive and are experiencing significant pressure and competition from mainland and international producers. Dairy and beef production are beyond the scope of this publication.

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**Be a good neighbor**

**Obey zoning restrictions.** Raise animals where you’re allowed to.

**Manage manure well.** Good manure management operations will have little odor and flies. Be sure your livestock is not the source of other pests (mosquitoes, gnats, fleas, ticks, lice).

**Prevent runoff problems.** Use measures to prevent soil and manure from leaving your farm during heavy precipitation.

**Protect groundwater.** Be sure you’re not overstocking animals and causing a pollution problem.

**Control dust.** It’s harmful to your animals’ health and will irritate the neighbors. Use good sod or pasture management.

**Keep down the noise.** Locate your animals away from your neighbor’s bedroom windows.

**Keep your operation neat.** Use paint and landscaping to keep your farm attractive.

**Visit your neighbors and explain what you’re doing.** Invite them to visit you and your farm.

Adapted from the *Small Farm Handbook*
University of California

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Photo by Mike DuPonte
RESOURCES AND RECOMMENDED READING

COMPANION WEBSITE
Use this document in conjunction with the CTAHR website Links for New Farmers. Additional information and updates are posted there.
<www.ctahr.hawaii.edu/sustainag/newFarmer/links.asp>

MANURE MANAGEMENT
ATTRA: Manures for Organic Crop Production
<attra.ncat.org/attra-pub/farmcompost.html>

ATTRA: Farm-Scale Composting Resource List
<attra.ncat.org/attra-pub/farmcompost.html>

COMPOSTING RESOURCES
On-Farm Composting Handbook (NRAES-54). 1992 by NRAES (Natural Resource, Agriculture, and Engineering Service). All rights reserved. For more information, please contact NRAES, (607) 255-7654, or nraes@cornell.edu. <www.nraes.org/publications/nraes54.html>

Composting Resources: A Series. 3-tape video series. The programs cover the benefits and costs of agricultural composting, ongoing research, and include practical farmer interviews. To order send $10 plus s/h to Agricultural Education & Extension Education, Video/Distance Learning Group, P.O. Box 442329, University of Idaho, Moscow, ID 83844-2329; (208) 885-7985.

COST-SHARE ASSISTANCE
The USDA NRCS Environmental Quality Incentives Program (EQIP) provides financial and technical assistance to farmers and ranchers who install conservation practices to address animal waste management and insufficient water supply for livestock. Contact your local USDA Natural Resources Conservation Service Field Office or check their website: <www.hi.nrcs.usda.gov>

POULTRY
American Pastured Poultry Producers Association, APPPA, P.O. Box 1024, Chippewa Falls, WI 54729; (715) 577-5966; Email: grit@apppa.org; Website: <www.apppa.org>

The Breeders Directory, Society for the Preservation of Poultry Antiquities, lists breeders of rare and antique poultry, their stock and delivery methods. Contact Glenn Drowns, 1878 230th Street, Calamus, IA 52729-9659; (563) 246-2299.


Profitable Poultry: Raising Birds on Pasture: This Sustainable Agriculture Network (SAN) bulletin features the latest research in a new “how-to” guide to raising chickens and turkeys using pens, movable fencing and pastures plus farmer experiences.<www.sare.org/publications/poultry.htm>

University of California, Agriculture & Natural Resources (ANR)
SWINE

**Profitable Pork: Strategies for Hog Producers:** This Sustainable Agriculture Network (SAN) bulletin showcases examples of alternate ways to raise pork profitably — in deep-straw bedding, in hoop structures and on pasture.

What do you need to raise pigs? by Dr. Halina M. Zaleski (8/28/2002), University of Hawaii Swine Extension Specialist. <www2.hawaii.edu/~halina/432/swinestart.pdf>

RABBITS

University of California, Agriculture & Natural Resources (ANR)
<br/>&lt;anrcatalog.ucdavis.edu/index.ihtml&gt;

RABBITS

University of California, Agriculture & Natural Resources (ANR)
<br/>&lt;anrcatalog.ucdavis.edu/index.ihtml&gt;

GOATS

American Cheese Society, 34 Downing St. New York, NY 10014; (212) 727-7939. A non-profit organization for the promotion of natural specialty cheeses.

University of California, Agriculture & Natural Resources (ANR)
<br/>&lt;anrcatalog.ucdavis.edu/index.ihtml&gt;

SHEEP

University of California, Agriculture & Natural Resources (ANR) Catalogue
<br/>&lt;anrcatalog.ucdavis.edu/index.ihtml&gt;


EXOTICS

ATTRA: *Ratite Production: Ostrich, Emu and Rhea* &lt;attra.ncat.org/attra-pub/ratite.html&gt;

American Ostrich Association, PO Box 163, Ranger, TX 76470 &lt;www.ostriches.org&gt;

American Emu Association, PO Box 224, Sixes, OR 97476 &lt;wwwaea-emu.org&gt;

GRAZING AND RANGELAND MANAGEMENT

Grazing Livestock Under Orchards by Glen Fukumoto, CTAHR<br/>&lt;www.ctahr.hawaii.edu/ctahr2001/InfoCenter/Forages/extensionResearch/GrazingUnderOrchards.doc&gt;


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