

Sheep – A Holistic View

by Paul W. Keiser

Wild grazing animals range across the world, from the Arctic musk oxen and caribou to the antelopes and cattle in the Tropics, seeking many different plants growing on different soils, in order to get all of the nutrition that their bodies need to grow, to reproduce and to be resistant to pests and diseases. William Albrecht's classic film *The Other Side of the Fence* tells this story. In the region where I farm — the Greater Grand Rapids area of Michigan — I see cattle under roofs eating dry haylage all year. In spring, the land turns green and lush, but these cattle keep eating their boring, monocultural, non-diverse food. It calls to mind a bread and water regimen for human prisoners.

We raise sheep, and we want them to be as healthy and well-nourished as possible, so when planning our feeding program, we begin by looking at the diet of their wild cousins. Bighorn sheep eat sedges, grasses (leaves, stems, flowers, seeds [grains in cereal grasses]), sagebrush, alpine plants and woody trees and shrubs. In the October 1998 *Stockman Grass Farmer*, dietary preferences are listed as: 60 percent grasses; 30 percent forbs/broad-leaved plants; 10 percent woody plants.

Note that alfalfa, with its fibrous taproot, may be more akin to woody plants, so it may be wise to limit its daily intake for cattle and sheep. The great grass eaters, horses, should get very small daily amounts of alfalfa. Goats may tolerate more, being the primary woody plant eaters. Dave and Jeff Mattocks at the Fertrell Company believe that some of the new strains of alfalfa are causing fertility problems in farm animals. Jay McCaman, author of *Weeds and Why They Grow*, says that some alfalfa is grown on soils that are too high in potassium, and are thus toxic.

Our sheep will eat most of the wild and domestic plants that grow in our region. Only stressed grazers, including those stressed by malnutrition, will eat toxic plants or substances. Since our sheep are in a very limited pasture with

The Ovine Legacy

Archeologists state that the oldest remains of domestic sheep have been found at Zawi Chemi Shanidar in what is now called Iraq, and estimate that they date back to 10,000 or 11,000 years ago. It is entirely possible that sheep were domesticated long before that time, but the remains haven't been found.

Williamson and Payne in *An Introduction to Animal Husbandry in the Tropics* (1959) state that the estimated world population of sheep at that time was 832 million. In *Foreign Agriculture, 1990-91* (USDA, Foreign Agricultural Service), 69 nations — excluding the United States and many others, thus well short of a true global number — reported a total sheep population of 706,727,000, with combined sheep and goat numbers at 1,249,322,000.

Sheep and goats are mountain animals, while cattle and horses are naturally valley inhabitants. In the United States, the Bighorn sheep are in the Rocky mountains, and Dall sheep are in the Alaskan mountains (Canada, too). In Asia's Himalaya mountains live the blue sheep. Archeologists have speculated that domestic sheep have descended from three species of Eurasian wild sheep: the argali (*Ovis ammon*) of Central Asia; the urial (*Ovis vignei*) of Asia; and the mouflon (*Ovis musimon*) of Asia Minor and Europe.

INTRODUCTION OF DOMESTIC SHEEP TO THE AMERICAS

In *Pennsylvania Agriculture and Country Life, 1640-1840* (1971), S.W. Fletcher states, "All early importations of livestock from Europe included sheep. They were brought to the West Indies by Columbus in 1493; to Florida by De Soto in 1565; to Virginia in 1609; to Massachusetts in 1624; and to New York in 1625. Dutch and Swedish pioneers on the Delaware brought sheep from Holland and Sweden."

In the late 10th century, Eric the Red led a group of Icelanders to Greenland and established one or two colonies near modern Julienehaab. They took cattle, horses, sheep, goats and pigs and produced milk, butter, cheese, meat and hides for use. A "Little Ice Age" that began in the 13th century ended the farm-based culture of the Greenland Norse people.

Recently, it has been stated that there are 60 breeds of sheep in the British Isles. British colonialism took sheep to the far-flung outposts of the empire, such as the Falkland Islands, Australia and New Zealand. In China, sheep are kept primarily for wool, buffalo are used for work, and pigs, ducks and chickens provide animal foods.



Before they are eating solid food, while their mothers are grazing, the lambs go running, climbing, and leaping as they develop their stamina, agility and coordination.

60 Elements in Kelp (% Content)

Element	Color*	%	Element	Color*	%
Aluminum (Al)	Orange	0.193000	Mercury (Hg)	Turquoise	0.000190
Antimony (Sb)	Orange	0.000142	Molybdenum (Mo)	Yellow	0.001592
Boron (B)	Orange	0.019400	Nickel (Ni)	Turquoise	0.003500
Barium (Ba)	Green	0.001276	Niobium (Cb)	N/a	Trace
Beryllium (Be)	N/a	Trace	Nitrogen (N)	Green	1.467000
Bismuth (Bi)	Indigo	Trace	Oxygen (O)	Blue	N/a
Bromine (Br)	Purple	Trace	Osmium (Os)	Yellow	Trace
Cadmium (Cd)	Red	Trace	Phosphorus (P)	Lemon	0.211000
Caesium (Cs)	Blue	Trace	Potassium (K)	Magenta	1.280000
Calcium (Ca)	Orange	1.904000	Palladium (Pd)	Yellow	Trace
Carbon (C)	Yellow	N/a	Platinum (Pl)	Yellow	Trace
Cerium (Ce)	Lemon	Trace	Radium (Ra)	Green	Trace
Chlorine (Cl)	Green	3.680000	Rubidium (Rb)	Magenta	0.000005
Chromium (Cr)	Turquoise	Trace	Rhodium (Rh)	Yellow	Trace
Cobalt (Co)	Violet	0.001227	Selenium (Se)	Orange	0.000043
Copper (Cu)	Orange	0.000635	Silicon (Si)	Orange	0.164200
Fluorine (F)	Turquoise	0.032650	Silver (Ag)	Lemon	0.000004
Gallium (Ga)	Violet	Trace	Sodium (Na)	Yellow	4.180000
Germanium (Ge)	Lemon	0.000005	Strontium (Sr)	Magenta	0.074876
Gold (Au)	Lemon	0.000006	Sulfur (S)	Lemon	1.564200
Hydrogen (H)	Red	N/a	Tellurium (Te)	Green	Trace
Indium (In)	Blue	Trace	Thallium (Tl)	Green	0.000293
Iodine (I)	Lemon	0.062400	Thorium (Th)	Lemon	Trace
Iron (Fe)	Lemon	0.089560	Tin (Sn)	Yellow	0.000006
Iridium (Ir)	Yellow	Trace	Titanium (Ti)	Lemon	0.000012
Lanthanum (La)	Lemon	0.000019	Tungsten (W)	Yellow	0.000033
Lead (Pb)	Indigo	0.000014	Uranium (U)	Lemon	0.000004
Lithium (Li)	Magenta	0.000007	Vanadium (V)	Lemon	0.000531
Magnesium (Mg)	Yellow	0.213000	Zinc (Zn)	Turquoise	0.003516
Manganese (Mn)	Scarlet	0.123000	Zirconium (Zr)	Lemon	Trace

*Elemental Spectro-Chrome colors are found in Dinshah P. Ghadiali's *Spectro-Chrome Metry Encyclopedia*. Earth is a divine painting, as are rocks, plants, animals and humans. The intrusion of industrialization, disemploying local craft and manufacturing shops, has concentrated "heavy metals" such as cadmium (red), chromium (turquoise), lead (indigo) and mercury (turquoise) in unnatural amounts that have entered into animals and humans, causing diseases and death. Indigo and turquoise are colors existing only in trace elements.

Red is an inflammatory color. Excesses of these colors in the divine animal and human physical bodies mar the divine health archetype. Elements in kelp are in an organic form. Louis Kernvan states in *Biological Transmutations* (1972) that the intake of organic silicon such as horsetail calcifies the body. In contrast, he writes, the ingestion of non-organic silicon decalcifies the body. Feeding diatomaceous earth every day may erode elements such as phosphorus and calcium out of the body.

Summer: branches of deciduous trees (leaves, twigs, bark, seeds)

Winter: branches of coniferous trees, especially pine, spruce and fir.

We have a 4-by-12-foot comfrey patch that grows up from its roots every spring, with a bit of compost and mulch. Comfrey leaves are cut and added to a daily feed mix most days throughout the growing season. The leaves can be dried in the shade in a non-humid space, for use in winter. For human health, comfrey root is said to be 20 times stronger than leaves and can be washed, dried, and ground to be added to soup, stew or encapsulated for ingestion.

WOOL

Wild sheep don't have wool. Like many aspects of domestic plants and animals, biological innovations in the species and varieties mostly occurred through the genius of our indigenous ancestors in prehistory.

The various breeds have fleeces that vary in length and texture. However, just like human hair, the quality of the fibers of the wool depend on diet and lifestyle. One sheep farmer told us that they shear before lambing because the stress of giving birth causes weaknesses in the wool fibers. We shear after lambing, and it does not seem to cause fiber weaknesses.

On shearing day, sheepman Paul Shetlerly comes from Ionia to shear, and Rita Petteys of Yarn Hollow comes and does preliminary cleaning of the fleeces. She buys between eight and 12 fleeces a year from us. Rita has the fleeces processed for several purposes: felting, roving, etc. Suzanne Pufpaff of Woodland Weavers and Spinners did the last processing. Rita then spins and dyes some of the wool. She said that some of our wool has gone to Belgium.

MILK SHEEP

Sheep dairies are more common in southern Europe than in North America. Feta and Roquefort cheeses are two of the most famous sheep-milk products. In the village of Roquefort, near Toulouse, France, cheesemaking is more than 600 years old, handed down in families for generations. Roquefort cheese is aged in natural caves and has been

an open barn, we bring the foods of the mountain and valley to them. In fact, sheep are better than pigs and chickens in utilizing plant crop by-products, "weeds" and household plant food wastes.

SHEEP DIET

We make sure all of our sheep have access to the following feeds and supplements:

Daily: hay, oats, wheat grains, dried molasses, Fertrell mineral mix (25 pounds Sheep Nutribalancer, 25 pounds Rumi-Cult Kelp, 10 ounces copper sulfate), vitamins A, D and E (in rice hulls).

Free choice: kelp meal (in buckets hanging on the pasture fence); Redmond salt block (in the sheep barn on the steps)

Weekly: herbs, such as sage, peppermint or spearmint, red raspberry leaves, fresh or dried comfrey leaves; diatomaceous earth (in winter, once a week, in summer, two or three times per week); granulated garlic; black walnut hull powder; winter squash, usually butternut, and grated carrots, these once or twice per week

Seasonal: apples; greens (especially brassicas); garden "weeds"; pasture; cut melons; cut grasses; etc.



During the growing season, sheep love the leaves, twigs and bark of deciduous trees.

protected by formal government since at least 1407. Only approved cheeses produced in Rouvergue, in the Western portion of the Pyrenees mountains and the island of Corsica can have the name Roquefort.

In Peter Matthiessen's book *East of Lo Monthang: In the Land of Mustang* (1996), there is a photo by Thomas Laird of a group of horned milking ewes tied together, with every other animal facing the same direction for convenient milking from the rear, in the Himalayan mountain culture.

CONCLUSION

In *Human Nature: Agricultural Biodiversity and Farm-based Food Security*, Hope Shand states: "Approximately 40 percent of the total land available in developing countries can only be used for some form of forage production. An estimated 12 percent of the world's population lives in areas where people

Sheep of the World

The ancient practice of nomadic herding continues today, for instance with reindeer in the Arctic, with sheep, goats, horses, camels and yaks in Asia and Africa, and in South America's Andes mountains with llamas, alpacas and other animals. Some herding of sheep and cattle continues in the American West.

In *Over the High Passes: The True Story of One Woman's Year in the Himalayas* (1987), Christina Noble recounts her experiences migrating with the semi-nomadic Gaddi people from winter in the Punjab moving up into the mountains of Himachal Pradesh. She notes that sheep seldom grazed above 14,000 feet elevation, but goats, being so agile, can graze at up to 17,000 feet. Cattle are grazed in the valleys. Teenage boys and girls take out the Gaddi flocks during the day, and men herd at night with guard dogs. Lambing time is in the autumn, after nutritious summer grazing. Shepherds do not slaughter their sheep, and if one is sold for meat, it is not allowed to be killed near the flocks or camp. On the move, small children ride on a bundle that is on mother or father's back, while newborn lambs are tucked into clothing and carried on the trek. When frightened, particularly by bears or leopards, goats will cry out, but sheep remain silent. Noble relates how a bear had stampeded a couple of hundred animals off a cliff to their death — in the spirit of ancient cooperative community

("We are all connected"), other Gaddi families gave sheep to the destitute family to get a new flock started.

BREEDS

Tropical lands vary from rainforest type (200-300 inches/year) to arid to semi-arid desert regions. Where there is a rainy season of three or four months, a long dry season follows. Animals must adapt to both the long dry period and extreme heat. Differing sheep breeds have adapted to the various environments. Thin-tailed breeds tend to be located in good rainfall lands. In the arid zones are found the fat-rumped breeds, the stored fat used by the body to survive food-scarce months.

Asia: The Lohi and Nellore breeds thrive in arid lands, and the Lohi can produce 3.6 kilograms of milk per day.

Arabia and the Horn of Africa: The Hejazi breed, a fat-tailed mutton-type thrives in dry lands.

South Africa: The Blackhead Persian breed has been used to improve other African breeds. Crossbreeding with the temperate type Dorset Horn sheep has produced the Dorper breed.

East Africa: The Somali is a fat-rumped sheep that resembles the Blackhead Persian.

Kenya and Tanzania: The Masai is a fat-tailed, coarse wool sheep.

Sudan: The Desert and Nilotic breeds provide meat and the Desert gives milk. The Zaghawa is herded by nomadic Arabs.

Central Africa: The West African Dwarf and Fulani (Uda) breeds are kept.

Western Hemisphere: The Criollo is a tropical breed that has been cross-bred with Romney Marshy Corriedale and English Down breeds.

Temperate breeds, Merinos and Rambouillets, are grazed in arid lands of the Americas and Australia. In tropical uplands, temperate-type breeds are often kept.

EXCEPTIONAL & ENDANGERED BREEDS

In *Human Nature: Agricultural Biodiversity and Farm-based Food Security*, Hope Shand states: "The Finn sheep . . . was cast aside decades ago and kept only by Finnish peasants. Today the Finn's fecundity — its ability to produce litters of lambs instead of singles or twins — is widely utilized in the sheep industry."

Ewes producing litters of sheep reminds me of cows with huge udders producing enormous amounts of milk, far, far beyond the needs of a calf or two. If five or six lambs come out of a ewe's body, this production must be nutritionally replaced with a total nourishing diet of proteins, fats, carbohydrates and minerals, the four constituents of foods (living organisms that all life feeds upon).

Can a ewe produce milk for five or six lambs? The last couple of years, we've kept a Targhee ram in with the flock

all year. As a result, in 2008, four ewes lambd two times; in winter, then in summer. The drain of nutrients in producing three or four lambs and the milk for them through most of the year caused two of the ewes' hoofs to become abnormal. Foot trouble comes from malnutrition, injury or standing in wet ground or manure. When the nutritional intake of the two ewes caught up with their bodily needs, the hoofs resumed a normal, functional shape. Keepers who trim goat and sheep hoofs every year need to examine the nutritional and dietary biodiversity needs of their herds and flocks.

Shand also takes note of some other exceptional breeds:

The Navajo-Churro sheep of the Southwestern United States is valued by Native Americans who use its strong and resilient carpet wool for weaving traditional rugs that are recognized internationally for their beauty and distinctive designs. . . .

Among the critically endangered animal breeds identified by FAO (UN Food & Agriculture Organization) are the North Ronaldsay sheep of the Orkney Islands that survive exclusively on a diet of seaweed . . . the Olkuska sheep native to southern Poland that are exceptionally prolific and sometimes produce litters of five or six lambs. . . .

Among the critically endangered breeds is the Gulf Coast Native sheep, a sheep that shows remarkable genetic parasite resistance, and adaptation to the high heat and humidity of their native habitat.

depend almost entirely on products obtained from ruminant livestock — cattle, sheep and goats."

She also notes: "No major livestock or poultry species is in danger of extinction, but numerous breeds within those species are declining in population and size, and many have already disappeared. In Europe, half of all breeds of domestic animals that existed at the turn of the [20th] century have become extinct, and 43 percent of the remaining breeds are endangered. The 1995 edition of FAO's *World Watch List for Domestic Animal Diversity* includes data on 3,882 breeds for 28 domestic species. It concludes that globally 30 percent of breeds are classified as endangered or critical."

In the developed world, work animals have been almost totally eliminated, with the urban majority having no experience of the absolute importance of farm and work animals to all human societies.

Addiction to petroleum is a major part of this problem. In the United States, the Amish are the major agricultural group that keeps and breeds farm and work animals. If citizens can respond in sufficient numbers to the economic and ecological crises, many will return to indigenous, subsistence forms of farming, which will bring back endangered plants and animals.

Adapting to just about all climates from the sub-Arctic to the tropics, the sheep is almost as adaptable as the human being!

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