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(ALMOST)
EVERYTHING YOU NEED TO KNOW
About Teaching Cows to Eat Weeds



WEED EATING COW SEEDS

WWW.LIVESTOCKFORLANDSCAPES.COM

PRESENTER

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This is a simple, inexpensive process that anyone can use to teach livestock to eat weeds in just 8 hours over 7 to 8 days.

WHY DON'T MY COWS EAT WEEDS ALREADY?

Because they never have, and there's nothing that says they should.

Here's what we've learned about how animals choose what to eat:

Mother is the most important influence on what a young animal eats. They will eat what she eats and avoid what she avoids. If Mom didn't eat a plant, and no herd mates eat it, the animal is unlikely to try it. As they grow, young animals begin to learn from their herdmates too.

Second, **animals are "neophobic" or afraid of new things.** Like us, they're likely to keep doing what they've always done as long as it works for them.

Here's a link to an article with videos showing how animals choose what to eat: <http://bit.ly/HowAnimalsChooseWhattoEat>.

To change their minds, we're going to use routine, and tasty treats to open trainees minds to all the tasty things in their pastures.

It's Not Magic. It's Animal Behavior.

I started teaching cows to eat weeds in 2004 with a pilot project at Grant-Kohrs Ranch National Historic Site in Montana. The simple process I developed and refined over the next few years is based on decades of research about how animals choose what to eat, and on the research done by animal behaviorists like Skinner and Pavlov.

It's Easy.

Farmers and ranchers don't have any time or money to waste. So I made the steps easy and inexpensive. Using them, anyone can teach a cow, sheep, goat, bison or any other creature to eat new foods in just 8 hours spread over 5 to 7 days.

I'm Here to Help!

Quit worrying about your weeds and start using them as forage. This handout has the training basics, along with links to articles and videos that will show you how to get started. If you run into problems as you train, send me an email with your phone number. I've trained so many animals that I can probably solve whatever you're running into over the phone.

Also, if you need general grazing information and How-Tos, head over to OnPasture.com, the free weekly grazing magazine I edit and publish.

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How to Teach a Cow to Eat A Weed

Check out this On Pasture article on the entire process, along with a video showing how I used this to train cows in Boulder, Colorado: <http://bit.ly/bouldercowseatweeds>

1. Know Your Plant.

Big Bonus - Weeds are nutritious and no more toxic than other forages!

Nutritional value is important because scientists have learned that animals choose what to eat based on the internal feedback from nutrients and toxins in their foods. The more nutritious a weed is, the more likely the animal is to eat it.

I've tested enough weeds for nutritional value to have developed a rule of thumb: "If it's green and growing, it's nutritious." In fact, most weeds are equal to or better than alfalfa in nutritional value. As forbs, they are generally less fibrous than grasses, so they are more digestible. Last but not least, many maintain their value through the growing season longer than grasses do. All this means that weeds are good forage.

But what about toxins?

All plants contain toxins, including the grasses we plant for our livestock. But very few plants are so high in toxins that they will cause harm or kill livestock.

Naturally, you don't want to teach your animals to eat a weed that could cause harm. To help you know the difference, I've put together information about weeds here:

www.livestockforlandscapes.com/edible.htm. And here's a flyer on Weed Nutritional Values and Toxins too: <http://wp.me/p31ZtI-2Aj>

2. Choose Trainees.

Big Bonus - You don't have to train all your animals. Herd mates will learn from each other when you mix trainees into the larger herd.

Make the process easy on you. Choose animals that will be around for awhile, and that are in a pasture that is convenient. It's best to have at least a dozen animals in your group. I generally train groups of 25 to 50 at a time.

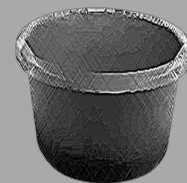
3. Make the unfamiliar seem familiar.

Big Bonus - Train once and you're done. As long as you have one trained animal on your place, or animals that have learned from a trainee, you will never have to train again.

Routine makes everything seem normal. Your training routine will be to show up at a particular time, morning and afternoon, making the same sounds, driving the same vehicle, with the same feed tub/trough, and something tasty for your trainees to try.

Every morning and afternoon for 4 days, you'll feed something an unfamiliar nutritious food. Just go to the feed store and pick 8 different things, one fifty pound bag per 25 cattle. Choose a variety of textures, flavors, shapes and smells (Soy flake, wheat bran, rolled oats, alfalfa pellets, range cubes,

Used supplement tubs are a great training tool. They're big enough that more than one animal can eat at a time, but deep enough that one can't see what the other is eating. This boosts competition and encourages trainees to try new things. You'll need one per 3 cows.



and COB for example). Trainees learn that every time you show up, they may not recognize what you're giving them, but it will surely be something good to eat.

On the 5th and 6th, and 7th days skip the morning feeding. Then clip weeds, mix with a bit of feed and serve them up in the afternoon. Loosely fill two 50 lb grain sacks or one 250 lb supplement tub per 25 cattle trainees.

Weeds will just be one more new thing in a series of strange things. Trainees will try the weeds, get the good feedback, and begin eating them in pasture. Start watching the weeds in your pasture as soon as you start feeding weeds. Trainees will often try them shortly after eating them in tubs.

Final Bonus - You don't have to train them to eat every single weed.

Once trainees realize that not all food looks the same, they will begin to experiment in pasture, and eventually eat a little, or even a lot of everything they find. Here's why, as long as they have variety, they won't be harmed. <http://wp.me/p31ZtI-M7>.

Bonus Training Tips

You don't have to teach cattle to eat every single weed in your pasture.

Choose one, teach them to eat that, and then watch to see what else they start to eat in pasture. If they don't try something that you know is safe for them. Bring a few training tubs out and put them near the weed you'd like them to try. Clip a bit of the weed, put it in the tub, and you're good to go. The cows will remember that the tubs mean "Good Food," they'll eat the weed, and then begin to eat it in pasture. It's easy!



Use your training tubs as a tool to make moving cows to new areas easier.

My trainees know that when they hear my truck horn or see me with tubs it means "Good Food." When I'm all alone and need to call them in from a long distance, I drive my truck to where I'd like them to be, honking along the way. I've also used the car alarm to call them while standing nearer their line of site holding a tub up so they can see. They come running, making it easier for me to work in large pastures by myself.



Working with stockers? Use weed training to acclimate them to their new home.

Even the wildest cattle and bison I've worked with have gentled as part of the short teaching process. They quickly learn to expect that the teacher brings good food and can be trusted.

By teaching your stockers to eat weeds, you'll also be able to use them to manage your pastures, and they'll put on weight thanks to the extra forage you have to offer beyond just grass.



Finally - here's another of my projects I'd like to share with you:



On Pasture.com

Translating research and experience into practices graziers can use NOW!

At 100,000 readers a month, On Pasture is the most widely read grazing resource online.

It's hard to know if the latest trend is going to work for you. That's where we come in. Each week you'll find something you can use whether it's **Grazing Management, Pasture Health, Livestock, or Money Matters**, all translated into steps you can adapt to your own operation.

Search our archive of over 2,000 articles to find just what you need for your operation or send us your questions to Kathy@onpasture.com, publisher and editor, and she'll find answers.

- Connect with those doing similar work, whether nearby or across the globe.
- Find inspiration and insight, motivation and community.
- Learn from those who've already done it.

Want to up your grazing game? Be part of the On Pasture Community!

Alternative Forage Info

This is a list of all the weeds I've trained animals to eat, or that I've researched at the request of readers. If you don't see your weed here, email me your plant's scientific name. I'll check it out for you. Kathy@onpasture.com

Absinth wormwood

(*Artemisia absinthium*)

Cattle can and do graze this plant in some places. What slows them down are its sesquiterpene lactones. These can be offset by extra protein (maybe from some of the other weeds in pasture). I'd start by teaching other things and then add this once they're "educated."

Baby's Breath

(*Gypsophila Paniculata*)

There's no indication that this causes problems. Best control will come based on grazing before it flowers.

Bedstraw spp.

(*Galium*)

This is a very high protein forage. Sheep in Vermont were trained to eat it and did very well on it.

Bittersweet Nightshade

(*Solanum dulcamara*)

The solanine in all nightshade species is believed to be the cause of potential poisoning. The risk appears to be erratic, but do not train your animals to eat this one. I have followed cattle that have eaten some nightshade species with no effect, as long as they had plenty of other forages to choose from.

Blackberry

(*Rubus sp*)

In some places cattle eat this without training. It runs 12-16% protein. Teach cattle to eat the smaller, softer shoots first.

Black Nightshade

(*Solanum nigrum*)

There is no indication that this plant causes poisoning, and it has protein values over 15%. The problem is that it can be confused with other species that have the potential for causing stomach irritation. Be sure you know what you have, or train your animals to eat something else first and let them add this on their own.

Blue Vervain

(*Verbena hastata*)

This is a North American native. There is no indication that this plant causes poisoning.

Bluweed

(*Echium vulgare*)

Species of this plant have been known to cause disease issues, especially in horses. It has not been proven to cause problems in North America, but that might be because it is a fairly new plant to the area and there has been no reason for animals to consume it. I would not train cows to eat this and would let them choose it on their own in pastures with plenty of variety.

Bracken Fern

(*Pteridium aquilinum*)

Do not teach your animals to eat this plant. It is poisonous when eaten repeatedly. If this is in your pastures, be sure that there is plenty of other forage for animals to choose from.

Buckthorn

(*Rhamnus spp.L.*)

The seeds, and to a lesser extent, the leaves, have laxative properties. But, because such a large amount has to be eaten, this plant is not a problem. I might teach cattle to eat something else first, and then let them add this to their diet later.

Burdock

(*Arctium spp*)

This is very edible. And people can eat it too! Search for it on the On Pasture website for recipes.

Smallflower Buttercup

(*Ranunculus abortivus*)

Although some species of buttercup seem to cause a degree of irritation to the digestive tract, it seems that animals rarely eat enough to be concerned about. I would not train animals to eat this plant. Instead, I'd teach them another weed and then let them teach themselves to eat this one.

Tall Buttercup

(*Ranunculus acris*)

This one is a tricky plant. I worked with a fellow in Virginia whose dairy cows were producing lots of milk on a buttercup, and he wanted to know how he could grow more. On the other hand, there are poisonous buttercups that shouldn't be grazed. **Talk to me** about which plant you have to know for sure. I wouldn't teach animals to eat this. Instead, teach them to eat other plants and let them decide on their own whether to add this to their diet.

Canada Goldenrod

(*Solidago canadensis*)

I've never had to teach a cow to eat this plant. Cattle simply begin eating it after being introduced to other weeds. It is a nitrate accumulator, so use the precautions I outline for Canada Thistle.

Canada Thistle

(*Cirsium Arvense*)

This is one of the easiest weeds to teach livestock to eat because it compares to alfalfa in nutritional value (21% protein in Spring, 13% in Summer, and 12% in fall). If you have this in your pasture, I'd highly recommend starting here. Once animals are eating this thistle, they quickly add other thistles to their diet and then begin looking around to see what other kinds of plants in the pasture could make good forage.

Spines are of no concern at all to grazers. It's actually the nitrates in this plant that cause a little bit of concern. To keep animals safe:

- Give rumen microbes time to adjust, introducing the food in small amounts over 5 to 7 days.
- Never put animals in a solid stand of this plant.
- Don't put hungry animals into a field that is primarily Canada thistle. Full ruminants prevent nitrate poisoning.

Other Thistles

Musk - *Carduus nutans*

Bull - *Cirsium vulgare*

Scotch - *Onopordum acanthium*

All thistles are very edible including these. Train them to eat one kind of thistle, and your cattle will eat them all.

Cheat Grass

(*Bromus tectorum*)

Graze this when it's green in the spring and fall for best control. I have seen educated cattle eat it mid-summer when it's dry and they're in a pasture with lots of other high protein weeds. I believe that's because they are balancing a rich diet with a little roughage.

Chicory

(*Cichorium intybus*)

Educated cattle in Boulder County, Colorado taught themselves to eat this. It may not be as nutritious because it's got a lot of stem to leaf. But it certainly has no harmful side effects.

Chickweed

(*Stellaria media*)

This is grown in Europe as a vegetable crop and ground cover for poultry. Let your livestock eat this one

Chinaberry

(*Melia azedarach*)

The stone fruits of these trees can cause poisoning in some cases, but the results seem to be variable. A pound and a half seems to be the minimum dose to poison sheep and goats, and though some pigs reportedly adapt to the toxins, others can be killed by a half pound of fruit. Leaves may likewise cause issues. On the other hand, extracts of the fruit have long been used in horses as a tonic and to control intestinal parasites such as stomach bots, and to repel moths in closets and chest.. Leaves placed in brooks are said to repel insects.

Chinese Tallowtree

(*Triadica or Sapium sebifera*)

Don't train your animals to eat this, but don't panic if they eat some on their own mixed with a variety of other forages. The foliage and fruits cause severe irritation of the digestive tract and a laxative effect in cattle. But they have to eat quite a bit: 1% of their body weight over a period of 5 or more days. If you have a lot, its sap used to be used for candles, rubber and soap.

Cocklebur

(*Xanthium strumarium*)

You must wait until this plant has at least 4 leaves before you put your stock in a pasture where it can be grazed. At the two-leafed stage, when very young, it has a toxin that affects the liver. Poisoning can occur when animals eat a large number of the two-leafed stage of the plants or when they eat seeds.

Comfrey

(*Arctium spp.*)

I wouldn't train animals to eat this but would not worry if they ate some as part of a widely varied diet.

Common Crupina

(*Crupina vulgaris*)

Again, there is no information showing that this plant has toxin issues. There is no reason your animals shouldn't eat it. Like Oxeye daisy and Hawkweed, this plant doesn't have a lot of leaves so may not be as palatable. I would focus on teaching other plants first and then let trainees add this one to their diet.

Creeping Bell Flower

(*Campunula rapunculoides*)

This plant is not associated with any known toxins. I have not trained animals to eat it, so I'd teach them to eat something else first and then let them add this on their own in a pasture with lots of variety.

Curlycup Gumweed

(*Grindelia squarrosa*)

Cows I trained to eat other weeds added this to their diet all by themselves. But though your cattle may learn to eat this on their own, it is not a plant that I would teach them to eat. It is a selenium accumulator, and as such can cause health issues if animals eat too much. Fortunately the trainees eating this plant had plenty of variety to choose from, so they did not eat enough to cause problems.

Curly Dock

(*Rumex crispus*)

Animals have been known to eat some of this plant but it is high in oxalates reducing its palatability. I would teach cows to eat other things first and then let them learn to eat this one on their own.

Cypress Spurge

(*Euphorbia cyparissias*)

There are a number of Euphorbia species listed that do cause irritation and even poisoning, but this one is not listed among them. I have not taught animals to eat this, so I would teach them to eat something else and then let them add this one on their own in a pasture with lots of variety.

Dalmatian Toadflax

Dalmatian (*Linaria dalmatica*)

Yellow Toadflax

Yellow (*Linaria vulgaris*)

I have worked with both these plants. It is easy to teach cattle to eat them and there is no reason they shouldn't graze them. Once in pasture my experience, and that of Montana ranchers, is that cattle will bite off each stem in a pasture, but control takes a long time because the plant is so hardy and there is a large seedbank.

Distaff Thistle

(*Carthamus lanatus*)

In 2006 I worked with ranchers in Marin County to teach their cattle to eat this weed also known as saffron thistle, false star thistle, and woolly safflower. It compares to alfalfa in nutritional value, and animals ate it successfully.

Dog Fennel

(*Eupatorium capillifolium*)

Though this can be a skin irritant for people, it doesn't seem to cause any problems for animals eating it. If you plan to train with this weed, be sure to wear gloves and long sleeves.

Dyer's Woad

(*Isatis tinctoria*)

This is not listed in my resources, and my goats did eat it. However, because I have limited information on it I would teach animals to eat other weeds first and let them try this on their own.

Fetid marigold/ Cinchweed

(*Pectis papposa*)

I would not teach animals to eat this weed simply because it smells so horrible when crushed or picked. That said, the cows I worked with in Colorado did eat this plant after having learned to eat others.

Field Bindweed

(*Convolvulus arvensis*)

High in protein, this plant can accumulate nitrates just as Canada thistle does. Follow the same cautions listed under Canada thistle to be sure your animals are safe grazing this. It's such a tasty plant that Boulder County cows would walk through grass to the next patch of bindweed.

Field Horsetail

(*Equisetum arvense*)

All species can be neurotoxic. Animals rarely eat enough to cause problems because the plant is coarse, and its high silica content reduces palatability.

Field Scabious/

Blue Button

(*Knautia arvensis*)

This is edible, but it's high stem to leaf ratio reduces palatability.

Foxtail

(*Sertaria viridis*)

This is edible, but it's the timing of grazing that will be the issue. Animals won't eat it when it's dry because it will have lost its nutritional value.

Fringed Sage

(*Artemisia frigida*)

Animals can eat this, as demonstrated by my Colorado trainees. You can train them to eat it, but I would probably choose something else and let them discover this one on their own.

Giant Knotweed

(*Polygonum sachalinense*)

Yes! Start slowly though. Knotweeds can be nitrate accumulators, so rumen microbes need 7 to 9 days to adapt.

Common greenbriar

(*Simlax rotundifolia*)

As with other brushy species this one should have crude protein levels in the 12 to 16% range and is a good choice for grazing by all classes of livestock.

Hemp Dogbane

(*Apocynum cannabinum*)

This one is toxic. It is poisonous when green or dry, and only 15-30 grams can be lethal to a horse or cow.

Henbit/Dead-nettle

(*Lamium amplexicaule*)

When sheep in Australia have eaten this plant it has caused neurologic problems. But these same problems have never occurred in North America. Scientists have even repeatedly attempted to reproduce the poisoning effects. But it required huge amounts of the plant to be consumed by the experimental animals. In one test, a sheep was fed 282 pounds over 13 days before exhibiting symptoms. In another, dried plants were fed for 26 days at 154% of bodyweight with no problems.

My resources say that sheep are more susceptible, if there is a problem, cattle and horses less so. Signs of poisoning occur after a period of stress when (i.e. being moved to a new pasture). The animal has a stilted gait, holds its head high and tremors begin in the shoulders and thighs until the animal loses control of its limbs and falls to the ground. Animals recover after 5 minutes. With rest, animals recover without treatment.

With all this in mind, I would not train animals to eat this. I would let them choose it after learning to eat other plants. I wouldn't worry about them eating it on their own as it takes such a large quantity to cause problems.

Himalayan balsam/ Policeman's Helmet

(*Impatiens glandulifera*)

Yes! It's edible.

Hoary alyssum

(*Berteroa incana*)

Yes! High protein, and it regrows well, so it can provide a lot of forage, especially during drought.

Horse Nettle

(*Lythrum salicaria*)

I worked with Don Ashford in Louisiana to teach his herd to eat this plant in pasture. They have been eating it for 5 years now with no harmful effects. You can read more here: <http://tinyurl.com/horsenettle>.

Houndstongue

(*Cynoglossum officinale*)

The toxins in this plant cause liver damage, wasting, and eventually death. Do not force livestock to eat this.

Ironweed

(*Vernonia gigantea*)

This is an edible plant, and a farmer in Missouri successfully trained his animals to eat it.

Italian thistle

(*Carduus pycnocephalus* L.)

I trained cattle to eat this in Marin County California. One rancher told me that there is no longer any Italian thistle on his property because the cattle ate all of it.

Japanese Honeysuckle

(*Lonicera japonica*)

Deer regularly eat this plant as do some livestock. It maintains year-round crude protein of between 12 and 16%, making it a very palatable choice.

Japanese Knotweed

(*Fallopia japonica*)

This is a good forage and people can eat it too! Start ruminants slowly. Knotweeds can be nitrate accumulators, so rumen microbes needs 7 to 9 days to adapt.

Japanese Privet

(*Ligustrum japonica*)

Reports that the berries are poisonous are not supported by experimental data. Train livestock to eat other plants and then allow them to try the privet on their own in pastures with variety.

Jimson Weed

(*Datura stramonium*)

This plant is toxic. Do not teach your animals to eat it, but don't be overly concerned about animals poisoning themselves by trying it. Small amounts cause them to lose their appetites, so they quit eating it quickly.

Knapweeds

Spotted (*Centaurea maculosa*)

Diffuse (*Centaurea diffusa*)

Russian (*Acroptilon repens*)

Big Head (*Centaurea macrocephala*)

Brown (*Centaurea jacea*)

Mountain bluet (*Centaurea Montana*)

Next to Canada thistle, these are my favorite weeds to train cows to eat. They are equal to alfalfa in nutritional value, animals take to

them quickly, and they eat a lot in pasture. If you graze Spotted and Diffuse before seed set, they will put out new flowers. But seed quantity and viability are greatly reduced.

Kudzu

(*Pueraria montana var. lobata*)

This plant is comparable to alfalfa in nutritional value and should be grazed early and often to keep it under control. The flowers can be made into a jelly that tastes like grape jelly and when bees use it they turn it into a runny red or purple honey that tastes like grape jelly or bubblegum.

Lambsquarters

(*Chenopodium album*)

This native is edible for animals and people.

Leafy Spurge

(*Euphorbia esula*)

It is not true that the latex in this plant causes harm to cattle. This is one of the first plants I trained cattle to eat in Montana. I chose it because I knew of a herd in Nebraska that ate this plant, and I figured if they could do it, I should be able to teach other cattle to eat it. Trainees grazed it in pasture, doing better when their pastures contained more variety. When they only had a little grass and lots of spurge, they didn't graze as much spurge.

Marshelder/

Sumpweed

(*Iva annua*)

This plant was cultivated by Native Americans 4,000 years ago for its high protein seeds (32%). It was abandoned for maize, and by

the time Europeans arrived it had disappeared as a crop. It is not listed in my poisonous plant resources. My preference for training would be to let animals choose this after being trained to eat other weeds. This is mostly because I've read it smells bad, which would make it less appealing to humans to cut and feed.

Maypop

Passionflower

(*Passiflora incanata*)

This plant doesn't show up anywhere in my poisonous plant resources and searches online show no issues with toxicity.

It seems this plant produces a tasty fruit, and it's the sole larval host plant for two butterflies so it would seem a shame to try to kill it with herbicide. If it's out of control in your pasture, give it a good grazing to knock it back.

Medusahead Rye

(*Taeniatherum caput-medusae*)

The reason animals don't want to graze this plant is its high silica content. Imagine eating sand, and what your gut might feel like afterwards. That's exactly what happens in a rumen. The silica slows processing of forage, and the animal doesn't readily experience any good feedback from the nominal nutritional value of the grass. The silica content even remains high when it is turned into hay. The only time this plant is palatable enough for grazing is very early in its growth stage. This makes it a grazing management issue, not a training or toxin issue.

Common Milkweed

(*Asclepias syriaca*)

I was once brought to a Vermont to teach cattle to eat this plant. When I arrived, they were already grazing it. If your cattle aren't eating it, train them to do it. But DO NOT train your horses. Milkweed can be poisonous to horses in amounts from 1/2 to 20 pounds. The toxicity is highest in the green plant, but is retained in the dried form so hay with milkweed is not good for horses either.

Macartney Rose

(*Rosa bracteata*)

Like Multiflora rose, this plant is very palatable. Focus on smaller stems when training livestock to eat it.

Mullein

(*Verbascum thapsus*)

Colorado cattle trained to eat other weeds decided to eat this one on their own.

Multiflora Rose

(*Rosa multiflora*)

This is another great plant to graze with cattle. Don't worry about the thorns. Cattle don't seem to mind them on this plant, or any other. There are no toxins of concern and it runs about 12-15% protein depending on how much of the woody part the animal eats. When training this plant, clip the softer, tender, leafy ends of branches. It might take a bit longer to harvest than other weeds, but the end result is worth it. A farmer I worked with in West Virginia is just tickled by how much multiflora rose his cattle eat.

Oxeye daisy

(*Leucanthemum vulgare*)

Hawkweed

(*Heracium spp*)

I worked with cattle producers in British Columbia to teach cattle to eat both these plants. The pictures of angus with white daisies in their mouths were beautiful! The biggest problem with grazing these plants is that they are mostly stem, and not very much leaf. That means that sometimes, when other forages are more prevalent, cattle will choose them. But don't be dismayed. They will still eat these plants. It just may take a bit more management to get the results you're looking for.

Perennial Pepperweed

(*Lepidium latifolium*)

This is similar to Hoary Cress in nutritional value and glucosinolates. Cattle are known to graze this plant so if yours aren't go ahead and give them a little training. It makes a great forage (and is also a peppery addition to your own salad.)

Pigweed

Smooth Pigweed

(*Amaranthus hybridus*)

Red Pigweed

(*Amaranthus retroflexus*)

Spiny Amaranth

(*Amaranthus spinosus*)

Pigweed was one of the favorite forages of the herd I worked with in Colorado. They taught themselves to eat it after I trained them to eat diffuse knapweed and dalmatian toadflax. It is high in protein, sometimes as much as

20%. But be aware that it can also be a nitrate accumulator. So help your animals' rumens adjust by feeding them small amounts over a period of a week to 10 days. Then always be sure that they have a variety of other forages to choose from in pasture. As a in interesting side note, *Amaranth* grains are high in lysine, an essential amino acid and was an important food for prehistoric people in Central and South America. It was a staple in the diets of the Aztecs and Mayans, until the Spanish priests discouraged its use in the 1500s. They didn't like that the Aztecs mixed it with human blood to make idols for their religious ceremonies.

Plantain

(*Plantago major*)

Not only should you teach your cattle to eat this, but you might want to try it out yourself. It is one of the most widely distributed medicinal crops in the world. It's leaves can be used to prevent infection, reduce pain and facilitate healing of wounds, stings and sores. Humans prefer to eat the young tender leaves raw and to boil the older leaves in stews. It's high in calcium and vitamins A, C, and K, iron and calcium which is stored in a form readily used by livestock. Plantain also has biologically active compounds that can positively influence rumen function and overall animal health. There is research underway to determine the extent of these effects.

Perilla Mint

(*Perilla frutescens*)

This plant is toxic. Do not teach your animals to eat it.

Poison Oak

(*Toxicodendron diversilobum*)

Cattle in a project I was working on in California ate this without any training at all and suffered no ill effects. Of course, people shouldn't train animals to eat this as it would be a very itchy process for them.

Poison Ivy

(*Toxicodendron radicans*)

Cattle, sheep and goats have all eaten this plant. I have heard of a project where goats started off eating it well, but after several days they stopped and would not eat more. They had been in a solid stand of poison ivy with no other forage available, so this was likely the problem.

Poison Hemlock

(*Conium maculatum* L.)

The name says it all. Don't teach your livestock to eat this.

Pokeweed

(*Phytolacca americana*)

Don't teach your livestock to eat this one. All parts of the plant are toxic, particularly the roots and seeds. Depending on how much is eaten, symptoms can include oral irritation, mild to severe colic, vomiting, bloody diarrhea, and infrequently, death, but only when relatively large amounts are consumed.

It can cause birth defects in humans, and should be handled

with gloves because it contains a protein that can be absorbed through cuts and abrasions on the skin and can have wide effects on the immune system.

Prickly Ash

(*Zanthoxylum americanum*)

Don't teach livestock to eat this. The plant has been studied for toothache relief, and it appears whatever chemical solves that problem can also cause neurological disorders in grazers. Symptoms include apparent blindness, a high-stepping gait, and an inability to drink or swallow. Eventually animals will lay down and struggle. Some may die, but most will recover over the following weeks with supportive care.

Prickly Pear

(*Opuntia* sp.)

Cattle everywhere eat this plant, and though some recommend searing off the spines first, I have found that it's not necessary. They seem to eat it with no negative consequences. Of course, I'd teach them to eat something else first and let them choose this plant on their own as harvesting it and feeding it is painful for humans.

Purple loosestrife

(*Lythrum salicaria*)

This plant is part of a family listed as "of questionable risk." It contains alkaloids, and some may be "biologically active" but no toxic issues have been reported. I would train animals to eat other plants first and then watch to see if they include this in their diet on their own.

Puncturevine

(*Tribulus terrestris* L.)

Do not teach your animals to eat this plant. It causes liver lesions, severe sensitivity to the sun and ends in death.

Quackgrass

(*Elymus repens* L.)

Elymus species are associated with grass tetany. The real problem with this, and with other undesirable grasses, is that it has a limited palatability window.

Ragweed

(*Ambrosia psiostrachya*)

This is a great forage. Cows in Boulder County preferred this to pasture grasses and ate it without any training. It runs 11.3% protein at mid-summer at full maturity.

Rush Skeletonweed

(*Chondrilla juncea*)

There is no indication that this plant has any toxins of concern and animals do graze it. The plant is most palatable before it puts on flowers, and grazing it can prevent it from flowering.

Russian Olive

(*Elaeagnus angustifolia*)

Crude protein runs between 12 and 15% for this plant. When training cattle to eat it, use the softer tips of branches so that they get the most digestible, highest protein parts as they're learning. Once they're happily eating it, they will eat twigs as big around as a woman's pinkie.

Russian Thistle

(*Salsola kali*)

I've trained cattle to eat this. Horses can be poisoned by eating very large quantities of this.

Saint John's Wort/ Goatweed

(*Hypericum perforatum*)

Don't train your livestock to eat this. While they can eat some as part of a balanced diet, it can cause photosensitivity which can cause illness.

Salt Cedar

(*Tamrix spp.*)

With no toxins of concern, protein values that are likely from 12-15% and tremendous resilience, this plant is good grazing. As with Russian olive, start with leaves and soft stems first. Animals will eat larger twigs as they become accustomed to this as a forage. I would love to do a salt cedar control project with cattle. Their large bodies can bust brush down better than goats can. Call me if you'd like to set up a project!

Sericea Lespedeza

(*Lespediza cuneata*)

Society for Range Management articles from the '40s and '50s talk about animals eating this and one of our On Pasture authors grew it as hay in the '60s. I highly recommend teaching cattle to eat this plant. It is also one of the few plants I would go back to the field for. Sericea still has some mysteries to solve and I'd love to help with those solutions.

Sheep Sorrel

(*Rumex acetosella*)

Oxalates give this plant its tart taste. In very high quantities, oxalates can cause poisoning problems, but animals have to eat a lot of it in a very short amount of time in order to overwhelm the rumen microbe's ability to process the oxalates. This plant can also be a nitrate accumulator.

What does that mean for using it as a forage? It's fine for livestock to eat it, but never put them in a solid pasture of this. Take the usual precautions of ensuring animals have a wide variety of forages to choose from.

Smartweed

(*Polygonum spp*)

Do not teach your animals to eat this. Although experiments on this species' toxicity have resulted in only suspicion, when problems do occur, animals have died. Chemicals in the plant may cause sensitivity to sunlight.

Smutgrass

(*Sporobolus indicus*)

There is nothing to indicate that this plant causes toxin issues. My guess is that it is low in palatability and matures early so livestock are not likely to eat it except when timed perfectly.

Spiny Amaranth

(*Amaranthus spinosus*)

Pigweed of all varieties were one of the favorite forages of the herd I worked with in Colorado. They taught themselves to eat it after I trained them to eat diffuse knapweed and dalmatian toadflax. They ate spiny

amaranth, smooth pigweed (*Amaranthus hybridus*) and Red Pigweed (*Amaranthus retroflexus*). Pigweeds are high in protein, sometimes as much as 20%. But be aware that it can also be a nitrate accumulator. Help your animals' rumens adjust by feeding them small amounts over a period of week to 10 days. Then always be sure that they have a variety of other forages to choose from in pasture.

Common Sunflower

(*Helianthus annuus L.*)

Trained cattle chose to eat this on their own.

Sulphur Cinquefoil

(*Potentilla recta*)

The tannins in this plant (17-22% dry weight) are good news and bad news. The good news is that these tannins have been shown to reduce parasite loads in livestock, and research has shown that animals will choose this food when they have parasites. On the other hand, tannins can reduce the amount an animal will eat. If I had more than one weed of concern, I would teach my livestock to eat it first, and then let them learn to eat Cinquefoil on their own. If this is the only plant I was worried about, I wouldn't hesitate to train cattle to eat it.

Common Tansy

(*Tanacetum vulgare*)

Livestock can eat this one, but be sure this is what you have and you're not confusing it with Tansy Ragwort which should NOT be grazed.

Tansy Ragwort

(*Senecio Jacobaea*)

Do NOT teach your livestock to eat this.

Tartary Buckwheat

(*Fagopyrum tataricum*)

This is edible for animals AND people!

Teasel

(*Dipsacus spp*)

This one does not appear in my reference books. I would not train animals to eat it until I come up with more information. Until then, I'd rely on animals to try it on their own after learning to eat other plants.

Thistles

Musk/Nodding - *Carduus nutans*

Bull - *Cirsium vulgare*

Scotch - *Onopordum acanthium*

Plumeless - *Carduus sp*

Marsh plume thistle - *Cirsium palustre*

Sow - *Sonchus spp*

All thistles are very edible. They are high in protein (often the equivalent of alfalfa) and cows take to them readily. Train stock to eat one and they'll try them all. If they don't, see the bonus training tips. If you have one of these kinds of weeds in your pasture, teach your cattle to eat them first, and they'll quickly add other plants to their diets as well.

Trumpet creeper

(*Campsis radicans*)

There are no known reports of this plant causing problems, though some people experience dermatitis after touching it.

Velvetleaf

(*abutilon theophrasti*)

This plant is a nitrate accumulator and it is unclear whether it contains something else that can cause poisoning. Cases are so rare that researchers have been unable to find a cause or treatment. I would not train my livestock to eat this. If they eat small amounts as part of a wide variety of other forages, I would not be concerned.

Ventenata

(*Ventenata dubia*)

The issue here is less about training livestock to graze it, than it is about the fact that it loses palatability very early in the season. It is very difficult to make an animal eat straw when there are other foods available that it actually needs to maintain health and grow. To manage this plant with livestock, you'll need to graze it early while it is still palatable.

Western Water

Hemlock

(*Cicuta douglasii*)

This is a poisonous plant. Do not teach your livestock to eat it.

White Heath Aster

(*Symphyotrichum ericoides, Aster ericoides*)

I found nothing in my poisonous plants books about this plant. I think it is perfectly safe to graze. I would teach animals to eat other things and let them move onto this one on their own.

Whitetop/Hoary

Cress

(*Cardaria draba*)

Every group of cattle I've worked with LOVES this plant. Protein values run from 30% when bolting to 8% in full seed. A Nevada rancher I worked with said that his herd survived one droughty summer thanks to whitetop grazing. He kept it vegetative by grazing it down and then regrazing when it grew back. As a member of the Brassica family, it contains glucosinolates which can cause enlarged thyroids. Fortunately, ruminants are not too prone to thyroid issues unless they eat very large quantities of Brassica plants.

Wild Carrot/Queen

Anne's Lace

(*Duacus carota*)

This plant is edible BUT it looks very similar to poison hemlock. I would not train livestock to eat this plant simply because I would be concerned I would choose the wrong plant and cause harm.

Wild Mustard

(*Sinapis arvensis*)

I trained cows in California to eat several types of wild mustard. They ate it happily. It is similar to Hoary cress in nutritional value.

Wild Parsnip

(*Pastinaca sativa*)

Yes, this is edible. BUT, be sure this is what you really have. It can look like some plants that are quite poisonous.

Yarrow

(Achillea millefolium)

This plant has been introduced as a feed in some places in New Zealand and Australia, though now it is considered a weed there.

I used to have my range school students chew some of the leaves because it causes a slight numbing on the tongue.

Yellow nutsedge

(Cyperus esculentus)

Prehistoric tools with traces of this plant on it show that people once ate the tubers of yellow nutsedge. I have no information on its nutritional value but it is edible.

Yellowstar Thistle

(Centaurea solstitialis)

Cows, goats and sheep have been successfully used to control this plant in research done at University of California, Davis. DO NOT train horses to eat it because it causes "chewing disease" and death.