

## Forage Palatability and Animal Preference

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Most graziers have spent some time watching their stock graze. Have you ever wondered why one clump of grass gets eaten and another is refused? Have you ever been curious enough to taste it yourself? Sounds crazy, but you might want to try it sometime! You don't need to actually chew up and swallow the blade of grass or clover leaf....it's more like wine tasting. Just hold it in your mouth, chew a little, and savor the flavor. Pay attention to how it feels on your tongue and how it smells, too. If this is a pleasant experience for you, it'll probably be pleasant for your stock. And that has a lot to do with what gets eaten, what gets refused and ultimately how much milk or meat gets made.

### A Time-Tested Practice.

Using your mouth as a method to test pastures is nothing new. Farmers used to make a habit of tasting pasture grasses to determine pasture readiness. The pasture taste test is a family tradition in the Ryan family. Back in the 1950s, Grandfather Ryan used this method to decide when to turn his dairy cows into a paddock. As time went on, a young Dick Ryan, fresh from college, talked the family into converting to the new confinement approach to dairying. A generation passed and the link that passed this practice from generation to generation was broken. Today, the Ryan farm is once again grass-based, now a stocker operation. And, the taste test is once again one of the criteria used for determining pasture readiness. Dick has relearned these skills by trial and error, and you can, too.

### Definitions.

Palatability can be defined as the relative attractiveness of plants to a feeding animal, whereas preference is the act of selection of plants by the animal. The palatability of a plant is determined by a variety of characteristics, including fiber content, flavor, nutrient and chemical content, and morphological features such as roughness or spines. Preference is a combination of learned and genetically programmed tastes as well as responses to nutritional needs and post-ingestive consequences (e.g. if the plant makes an animal sick, it learns to avoid it).

The features that make plants less palatable are often survival adaptations. Tall fescue is a good example: not only does it have an alkaloid-producing endophyte that gives it a bitter taste, but it also has stiff, rough-edged leaves. Anyone who is unlucky enough to have tall fescue in a mixed pasture has seen this first hand. What grass is left untouched after a grazing event, giving it a distinct regrowth advantage over the more palatable grasses that have been eaten to the ground?

There are some very obvious palatability differences between grasses, legumes, and broadleaves. Compared to grasses, legumes, such as alfalfa, seem to maintain their good taste and pleasant feeling longer. And there are differences among legumes with red clover and white clover differing dramatically. Ever wonder why livestock will always eat the wild white clover first, try a bit, then taste some other grass or legume next to the white clover? Try it, and you'll understand. Many broadleaves are even more palatable. Dandelions are extremely tasty and feel very pleasant in the mouth (trendy restaurants use them in salads). They remain palatable for longer periods than grasses or legumes.

Let's think about the interaction between taste and feel. Try a thistle leaf and a thistle flower from the same plant (watch out for thorns AND bees!). Once you have tried the thistle, it will be clear why livestock eat

thistle flowers, but nothing else. Here's a more subtle example: Try bluegrass at day 7 and again at day 30. The taste or flavor of this grass doesn't change much as it matures, but the feel does. Or compare 'native' smooth bromegrass with just about any of the new bromegrass varieties. The feel will be about the same, but the native brome will always taste better. Ever wonder why your livestock eat the old fence rows and waterways first?

#### Picky Eaters.

There's no escaping the interactions of palatability and preference either. A recent study of a confinement system on a Total Mixed Ration showed that dairy cows 'pick through' even the most thoroughly mixed ration (L. Armetano and R. Martin, 1999). The study broke the day into four 6-hour feeding periods and the researchers measured the particle size of material left in the bunk at the end of each period. The goal was for each cow to consume about 3 pounds of long fibers during each 6-hour period for a total of 9 to 10 pounds. What happened was that the cows actively sorted the ration placed in front of them, and actually consumed less than half a pound of long fibers during each of the first two 6-hour periods, 2 pounds during the third, and 4 pounds during the fourth, avoiding altogether about 25% of the long fibers that were intended as part of a balanced ration. Given the choice, cows eat dessert first and skip as much of the 'healthy stuff' as they can get away with!

#### The Hows and Whys of Palatability.

So, we can't avoid dealing with animal preferences, and in a pasture setting, we certainly can't avoid palatability differences. But we can minimize their effects and perhaps even use them to our advantage.

Not only does palatability vary among species, but there are also documented differences among varieties of equivalent maturity within the same species, and even palatability differences within varieties (if it's not a hybrid, there will be variation among individual plants). And of course palatability varies with maturity of the plant, as well as with growing conditions. Younger, less fibrous leaves are preferred to mature reproductive stems and plants grown under drought conditions or other stressful conditions are more likely to be refused than those with adequate moisture and fertility.

Palatability even varies within the same plant during the course of the day. During the day while the sun is shining, energy is captured through photosynthesis as simple sugars and carbohydrates. At sundown, the plant shifts gears and begins converting these simple sugars into more complex carbohydrates which are either stored in the roots or used as building blocks for structural and reproductive growth in the plant. So, sugar accumulates in plant tissues during the day till sundown and then declines overnight to its lowest point at sunrise. While plant species vary widely in other features of palatability, all are 'sweeter' at sunset than at sunrise. Moving the herd to a fresh paddock in the evening could result in improved intake.

How else can we use our knowledge of palatability and animal preferences to improve pasture management? We can even out differences in palatability by managing fertility properly and seeding compatible species with similar maturities. We can also minimize the effects of differences in palatability by using high stocking density, short duration rotations.

Most important, we can graze pastures at the proper stage of growth and learning to judge pasture maturity by taste can help with that. Ryegrass is very tasty and has a pleasant feel in your mouth during the early stages of maturity. Try it again at day 25 to understand these differences. Orchardgrass lasts a little longer, but after day 35 becomes unpalatable. Try quackgrass at day 15 and day 35, and timothy at day 20 and day 40. As you gain experience with this method, you'll see differences in how well your herd cleans up the pasture. You'll never be able to predict what your animals are going to select, but putting a palatable, mixed pasture in prime condition in front of them every day is a good place to start.

## Biographies:

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Dick Ryan is a stocker beef grazer in Columbia County. With his wife, Terri, he grazes up to 1100 steers each year on a 1000 acres of pasture. Sons Cory, 23, and Shane, 20, help out when they're home from college.