



# Vines and Orvines



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## Training a Food Aversion in Sheep

Training sheep to have a food aversion is a simple process, but there are important steps to follow to improve the strength of the aversion. Read these directions carefully and thoroughly before beginning the aversion training process.

The basic process of training a food aversion in sheep is to allow the sheep to eat the food of interest, the food that sheep will be averted to, and immediately administer a measured dose of lithium chloride (LiCl). The LiCl will cause a temporary stomach illness that the sheep will then associate with the food they had just consumed. It is very important that the food is novel to the sheep, meaning the sheep have never consumed this food before, and that other food is withheld prior to and after the food of interest is fed to the sheep for the training process. More detailed information on the feeding process is described later.

Begin planning the aversion training process well ahead of time. First consider the correct time of year when to train the aversion. If you are training an aversion to plants or plant material that is only available during certain times of the year, such as grape leaves, then you need to conduct the training process when that material is available. Remember that leaves of any plant will change in quality (flavor, texture, nutrition, secondary compounds) throughout the year. If you want sheep averted to spring growth, then it may be better to use spring growth for the aversion training process. As previously stated, it is important that the sheep have never consumed the food of interest before the training process. If the sheep have had a positive experience from eating the food of interest prior to the training process, the aversion will most likely be weakened by this positive experience.

### Materials needed for the aversion training process

1. Sheep with known weights. It is best to mark each sheep with a unique number on both sides with a paint brand or other marker. Only use paint and marking material made for marking sheep. This number is useful to easily identify each sheep in the corral and in the field.
2. An ample supply of the novel food of interest.
3. Feed tubs or forage clamps to hold the food for the sheep to eat. When feeding grape leaves, the sheep readily consumed the leaves and stems when they were placed upright in a forage clamp as opposed to placing the leaves on a platform. Figure 1 is a picture of a forage clamp used to feed grape leaves.
4. LiCl solution (see section on Determining the Correct Dosage of LiCl...). Laboratory grade LiCl can be purchased from chemical companies such as Sigma Aldrich (<http://www.sigmaaldrich.com>) and Fisher Scientific (<http://www.fishersci.com>) or from laboratory supply companies such as The Science Company (<http://secure.sciencecompany.com>).
5. Drench gun or drench syringe.



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6. A small corral area or chute where sheep can be administered the dose of LiCl without much room to move around.

## Aversion training process

Once you have decided on the date to conduct the aversion training, gather the materials that are needed so that everything is readily available well before you begin the process. About two weeks before you intend to conduct the aversion training it is useful to test the palatability of the plant material with a few sheep. This is done to determine how much time you will need to prepare the sheep for the training. It is important that on the day of the aversion training the sheep are readily eating the plant material. If during the test you find that the sheep are only eating a few bites, then you will need to spend some time over several days to acclimate the sheep to the new food. While some sheep will aggressively consume a novel food at their first exposure to the food, as has been observed with grape leaves, other sheep may take several days to reach the same level of consumption. During the period of time to acclimate the sheep to the new food, it is important not to let the sheep have too much of a positive experience from eating the new food. One episode of aggressive consumption is about all that should be permitted before following through with the administration of LiCl.

Once you are confident that the sheep are readily consuming the new food the aversion training can be completed. In the evening on the day before the aversion training, place all the sheep in a corral and withhold feed, but always provide the sheep with fresh and clean water. By morning the sheep will have digested much, but not all, of their rumen contents and they will be very hungry. It is best to conduct the training process on small groups of sheep of 5 to 10 individuals, depending on the number of people you have to help and observe. Place the first group of sheep in a pen with the food, either in a tub or a forage clamp, and allow them approximately 10 to 15 minutes to consume the food. The more consumption the better, but any amount over 20 bites is adequate to avert the sheep. Immediately after the sheep have consumed the food, administer the correct dose of LiCl solution that corresponds with each individual's sheep's body weight. When using the drench gun or syringe, be sure the head is upright, the neck slightly extended and the drench tube in the back of the mouth. Inject the solution firmly, but not so quickly that it squirts into their throat causing them to aspirate some of the solution. Hold the head upright for a few seconds after injecting the solution to be sure the solution is swallowed. After all the sheep in the group are administered LiCl, move the group of sheep to another corral with water and no food. Be sure that the corral floor and any feed bunks are clean of straw, feed and other plant material the sheep may eat. Repeat this procedure with the rest of the sheep. Once all the sheep have been dosed with LiCl, wait at least one to two hours before feeding the sheep their basal ration. A basal ration is an amount of feed equal to about 1.5% of the animal's body weight.



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## Testing the Aversion

The aversion can be tested as soon and the day following the aversion training. Begin by withholding the basal ration starting the evening before the test. Expose groups of 5 to 10 sheep to the food of interest for about 5 minutes. Some sheep may take a few bites, but they shouldn't eat any more than 5 to 10 bites. Any sheep that consume more than 10 bites should be re-dosed with LiCl. If some sheep are questionable as to whether they should be re-dosed, you can encourage them to eat more of the food of interest by placing them in a pen with un-averted sheep. The partially averted sheep may be encouraged to eat more aggressively if it sees other sheep eating the same food.

## Considerations

Make sure your animals have ad libitum access to salt. LiCl is not normally lethal at the specified doses unless animals are deficient in sodium. Lithium and sodium are similar chemically. Lithium takes the place of sodium in the body when animals are deficient in sodium.

Make sure the basal ration is familiar. Animals need to be on their basal ration at least two weeks, but a month would be better, prior to giving them LiCl. Otherwise, animals may form an aversion to their basal ration. Make sure you remove the basal ration the night before animals are dosed with LiCl. Animals can form temporary aversions to familiar foods. If your animals have a rumen full of their basal ration and a few bites of the plant when you dose them with LiCl, they're likely to avoid both foods.

Make sure you use novel plants. The more novel the food the more persistent the aversion will be.

Figure 1. Picture of a forage clamp made with two 2" x 6" x 8' boards, four ½" bolts and two stands.



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