Determining the Correct Dosage of Lithium Chloride (LiCl) for Training a Food Aversion in Sheep

The amount of LiCl administered to each sheep depends on the weight of the sheep and the <u>strength</u> of the dose you should apply. The weight of each sheep is easy to determine by weighing the sheep on a scale. A more difficult determination is deciding how much LiCl should be administered given the sheep's dietary experience. Sheep with very little dietary experience, feeding on only a few types of forage, will most likely be averted to specific feeds with a very small dose while sheep with broad dietary experience may need a moderate to high dose of LiCl. Sheep that have grazed rangeland forages with a high diversity of plant species may need the higher dose of LiCl than sheep that have spent most of their time on irrigated pasture or in corrals eating hay. The strengths of the LiCl doses are indicated below.

Small LiCl dose	=	125 mg LiCl per kg body weight
Moderate LiCl dose	=	150 mg LiCl per kg body weight
High LiCl dose	=	175 mg LiCl per kg body weight

Once you have the weight of the sheep and the strength of the dose you should apply, use the following formula to calculate how much LiCl each sheep should receive.

$$\frac{kg\ body\ wt.}{} \quad X \quad \frac{mg\ LiCl}{kg\ body\ wt.} \quad X \quad \frac{1\ gram}{1000\ mg} \quad = \quad grams\ LiCl$$

For example, if you have an ewe that weighs 72.6 kg and you want to administer a moderate dose of 150 mg LiCl per kg of body weight, you will calculate the dosage as follows.

$$\frac{72.6\ kg\ body\ wt.}{} \quad X \quad \frac{150\ mg\ LiCl}{kg\ body\ wt.} \quad X \quad \frac{1\ gram}{1000\ mg} \quad = \quad 10.9\ grams\ LiCl$$

Since we are more familiar with pounds than kilograms, we can calculate the amount of LiCl by using a pounds-to-kilograms conversion factor in the formula.

$$\frac{160\ lbs.\ bw}{} \quad X \quad \frac{1\ kg}{2.2\ lbs.} \quad X \quad \frac{150\ mg\ LiCl}{kg\ body\ wt.} \quad X \quad \frac{1\ gram}{1000\ mg} \quad = \quad 10.9\ grams\ LiCl$$

Although it is time consuming to calculate the exact dosage for each sheep, it is a good exercise to understand. In situations in which many sheep will be averted it is more efficient to use a standardized solution of LiCl and administer the solution orally using a drench gun or drench syringe. An easy standardized solution can be made with 500 grams of LiCl and 750 milliliters of water to make a total of 1000 milliliters or 1 liter of solution with a concentration of 0.5 grams of LiCl per ml. Using this solution concentration, the dosage amounts can be quickly identified in Table 1 for the various weights of the sheep that you will avert.

First you will need to make the standardized solution by following these directions.

To make a liquid LiCl solution, mix the following amounts or equal proportions of water and LiCl.

- 500 grams LiCl
- 750 milliliters water

Mixing Instructions:

1. Start with a mixing vessel that is larger than 1 liter.
2. Measure all the water and pour into the mixing vessel.
3. Slowly add the LiCl to the water and stir the mixture. **DO NOT ADD THE WATER TO THE LiCl.**
4. As you add the LiCl to the water and stir the solution, the mixture will generate heat. You can place the mixing vessel in a water bath to cool the solution as you stir.

Makes 1 liter of solution with a concentration of 0.5 gram LiCl/ml of solution.

Remember that 1 ml = 1 cc

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Table 1. Amounts of LiCl solution (0.5 grams/ml) to orally administer based on body weight and strength of dose.

Body Weight, pounds	Body Weight, kg	ml of LiCl solution SMALL DOSE	ml of LiCl solution MODERATE DOSE	ml of LiCl solution HIGH DOSE
40	18.2	5	5	6
50	22.7	6	7	8
60	27.3	7	8	10
70	31.8	8	10	11
80	36.4	9	11	13
90	40.9	10	12	14
100	45.5	11	14	16
110	50	13	15	18
120	54.5	14	16	19
130	59.1	15	18	21
140	63.6	16	19	22
150	68.2	17	20	24
160	72.7	18	22	25
170	77.3	19	23	27
180	81.8	20	25	29
190	86.4	22	26	30
200	90.9	23	27	32
210	95.5	24	29	33
220	100	25	30	35
230	104.5	26	31	37
240	109.1	27	33	38
250	113.6	28	34	40

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