

Beef Cattle Handbook



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Shrinkage in Beef Cattle

Roger Brownson, Extension Livestock Specialist, Montana State University

In cattle sales, the highest price per pound does not necessarily mean the highest return per animal. The number of actual pounds involved may be more important, which is why shrinkage is a vital consideration.

Types of Shrink

Weight loss in cattle can be classified according to the following two types of shrink:

Excretory shrink is the loss of belly fill. Animals held off feed and water for a 12-hour stand usually exhibit only excretory shrink. It takes a relatively short period on feed and water to refill the stomach and bring an animal's weight back to normal if shrinkage was due only to excretory shrink.

Tissue shrink. A decrease in the carcass weight occurs on long extended hauls or during long periods of fast. It takes longer for animals to recover from tissue shrink than from excretory shrink.

These two types of shrinkage probably do not occur as two distinct phases of the shrinkage process. In the early part of shipment only excretory shrinkage occurs. At an undefined stage in movement, both excretory and tissue shrinkage occur simultaneously. During the latter part of transit, tissue shrinkage is relatively more important.

Price Adjustments for Shrink

Table 1 and 2 are designed to make price adjustments to compensate for different shrinkage conditions.

Conditions Affecting Shrink

The loss of weight from an overnight shrink, or a 12-hour stand, will vary because of the type of feed. Cattle on grass, wet beet pulp, or silage will generally shrink 4 percent while fat cattle on concentrates will shrink from 2.5 - 3 percent if no feed or water is available. If feed and water are available as a free choice, morning weights of fat cattle will be about 2 percent less than evening weights.

Range cattle, unfamiliar with enclosures often shrink more than 5 percent when held in the drylot overnight. They are accustomed to running in the open and will be upset and nervous when penned up. This is especially true of calves cut off from their mothers and shut up for the first time. Also, cattle in a strange pen will shrink more than if they are in familiar surroundings.

In a study in Iowa, involving 4,685 feeder cattle, it was found that an average shrink of 7.2 percent occurred in cattle purchased from a rancher as contrasted with 9.1 percent from those purchased from a sale yard. The cattle were shipped varying distances, from 150 to 1,133 miles. The results were a .61 percent shrink for each 100 miles in transit.

A controlled experiment at the University of Wyoming showed that a considerable difference occurs in the shrink of feeder steers, depending on the conditions to which they are subjected. Table 3 shows those differences.

Table 1.
Buying Cattle Change in Price to Compensate for Shrinkage
(Prices, \$ per cwt.)

Offer	2%	3%	4%	6%	8%
90.00	91.84	92.78	93.75	95.75	97.83
89.00	90.82	91.75	92.71	94.68	96.74
88.00	89.80	90.72	91.67	93.62	95.69
87.00	88.78	89.69	90.63	92.55	94.57
86.00	87.76	88.66	89.58	91.94	93.48
85.00	86.73	87.63	88.54	90.43	92.39
84.00	85.71	86.60	87.50	89.36	91.30
83.00	84.69	85.57	86.46	88.30	90.22
82.00	83.67	84.54	85.42	87.23	89.13
81.00	82.65	83.51	84.38	86.17	88.04
80.00	81.63	82.47	83.33	85.11	86.96
79.00	80.61	81.44	82.29	84.04	85.87
78.00	79.59	80.41	81.25	82.98	84.78
77.00	78.57	79.38	80.21	81.91	83.70
76.00	77.55	78.35	79.17	80.85	82.61
75.00	76.53	77.32	78.13	79.79	81.52
74.00	75.51	76.29	77.08	78.72	80.43
73.00	74.49	75.26	76.04	77.66	79.35
72.00	73.47	74.23	75.00	76.60	78.26
71.00	72.45	73.20	73.96	75.53	77.17
70.00	71.43	72.16	72.92	74.47	76.09
69.00	70.41	71.13	71.88	73.40	75.00
68.00	69.39	70.10	70.83	72.34	73.91
67.00	68.37	69.07	69.79	71.28	72.83
66.00	67.35	68.04	68.75	70.21	71.74
65.00	66.33	67.01	67.71	69.15	70.65
64.00	65.31	65.98	66.67	68.09	69.57
63.00	64.21	64.95	65.63	67.02	68.48
62.00	63.27	63.92	64.58	65.96	67.39
61.00	62.24	62.89	63.54	64.89	66.30
60.00	61.22	61.86	62.50	63.83	65.22
59.00	60.20	60.82	61.46	62.77	64.13
58.00	59.18	59.79	60.42	61.70	63.04
57.00	58.16	58.76	59.38	60.64	61.96
56.00	57.14	57.73	58.33	59.57	60.87
55.00	56.12	56.70	57.29	58.51	59.78
54.00	55.10	55.67	56.25	57.45	58.70
53.00	54.08	54.64	55.21	56.38	57.61
52.00	53.06	53.61	54.17	55.32	56.52
51.00	52.04	52.58	53.13	54.26	55.43
50.00	51.02	51.55	52.08	53.19	54.35
49.00	50.00	50.52	51.04	52.13	53.26
48.00	48.98	49.48	50.00	51.06	52.17
47.00	47.96	48.45	48.96	50.00	51.09
46.00	46.94	47.42	47.92	48.94	50.00
45.00	45.92	46.39	46.88	47.87	48.91
44.00	44.90	45.36	45.83	46.81	47.83
43.00	43.88	44.33	44.79	45.74	46.74
42.00	42.86	43.30	43.75	44.68	45.65
41.00	41.84	42.27	42.71	43.62	44.57
40.00	40.82	41.24	41.67	42.55	43.48
39.00	39.80	40.21	40.63	41.49	42.39
38.00	38.78	39.81	39.58	40.43	41.30
37.00	37.76	38.14	38.54	39.36	40.22
36.00	36.73	37.11	37.50	38.30	39.13
35.00	35.71	36.08	36.46	37.23	38.04
34.00	34.69	35.05	35.42	36.17	36.96
33.00	33.67	34.02	34.37	35.11	35.87
32.00	32.66	32.99	33.33	34.04	34.78
31.00	31.63	31.96	32.29	32.98	33.70
30.00	30.61	30.93	31.25	31.91	32.61

Table 2.
Selling CattleNet Prices after Allowing for Shrinkage
(Prices, per cwt.)

Offer	2%	3%	4%	6%	8%
90.00	88.20	87.30	86.40	84.60	82.80
89.00	87.22	86.33	85.44	83.66	81.88
88.00	86.24	85.36	84.48	82.72	80.98
87.00	85.26	84.39	83.52	81.78	80.04
86.00	84.28	83.42	82.56	80.84	79.12
85.00	83.30	82.45	81.60	79.90	78.20
84.00	82.32	81.48	80.64	78.96	77.28
83.00	81.34	80.51	79.68	78.02	76.36
82.00	80.36	79.54	78.72	77.08	75.44
81.00	79.38	78.57	77.76	76.14	74.52
80.00	78.40	77.60	76.80	75.20	73.60
79.00	77.42	76.63	75.84	74.26	72.68
78.00	76.44	75.66	74.88	73.32	71.76
77.00	75.46	74.69	73.92	72.38	70.84
76.00	74.48	73.72	72.96	71.44	69.92
75.00	73.50	72.75	72.00	70.50	69.00
74.00	72.52	71.78	71.04	69.56	68.08
73.00	71.54	70.81	70.08	68.62	67.16
72.00	70.56	69.84	69.12	67.68	66.24
71.00	69.58	68.87	68.16	66.74	65.32
70.00	68.60	67.90	67.20	65.80	64.40
69.00	67.62	66.93	66.24	64.86	63.48
68.00	66.64	65.96	65.28	63.92	62.56
67.00	65.66	64.99	64.32	62.98	61.64
66.00	64.68	64.02	63.36	62.04	60.72
65.00	63.70	63.05	62.40	61.10	59.80
64.00	62.72	62.08	61.44	60.16	58.88
63.00	61.74	61.11	60.48	59.22	57.96
62.00	60.76	60.14	59.52	58.28	57.04
61.00	59.78	59.17	58.56	57.34	56.12
60.00	58.80	58.20	57.60	56.40	55.20
59.00	57.82	57.23	56.64	55.46	54.28
58.00	56.84	56.26	55.68	54.52	53.36
57.00	55.86	55.29	54.72	53.58	52.44
56.00	54.88	54.32	53.76	52.64	51.52
55.00	53.90	53.35	52.80	51.70	50.60
54.00	52.92	52.38	51.84	50.76	49.68
53.00	51.94	51.41	50.88	49.82	48.76
52.00	50.96	50.44	49.92	48.88	47.84
51.00	49.98	49.47	48.96	47.94	46.92
50.00	49.00	48.50	48.00	47.00	46.00
49.00	48.02	47.53	47.04	46.06	45.08
48.00	47.04	46.56	46.08	45.12	44.16
47.00	46.06	45.59	45.12	44.18	43.24
46.00	45.08	44.62	44.16	43.24	42.32
45.00	44.10	43.65	43.20	42.30	41.40
44.00	43.12	42.68	42.24	41.36	40.48
43.00	42.14	41.71	41.28	40.42	39.56
42.00	41.16	40.74	40.32	39.48	38.64
41.00	40.18	39.77	39.36	38.54	37.72
40.00	39.20	38.80	38.40	37.60	36.80
39.00	38.22	37.83	37.44	36.66	35.88
38.00	37.24	36.86	36.48	35.72	34.96
37.00	36.26	35.89	35.52	34.78	34.04
36.00	35.28	34.92	34.56	33.84	33.12
35.00	34.30	33.95	33.60	32.90	32.20
34.00	33.32	32.98	32.64	31.96	31.28
33.00	32.34	32.01	31.68	31.02	30.36
32.00	31.36	31.04	30.72	30.08	29.44
31.00	30.38	30.07	29.76	29.14	28.52
30.00	29.40	29.10	28.80	28.20	27.60

Table 3. Shrinkage Loss Due to Different Handling Conditions

Conditions	Percentage of Shrink
8-hour drylot stand	3.3
16-hour drylot stand	6.2
24-hour drylot stand	6.6
8 hours in moving truck	5.5
16 hours in moving truck	7.9
24 hours in moving truck	8.9

There are also indications that a considerable difference exists in the amount of fill that individual animals will consume during different periods of the day. This explains, in part, the wide variation in shrinkage of individual animals.

Extremes of hot and cold temperatures can affect shrinkage to a large extent, but wind, rain, snow, humidity, and other wet weather conditions have more effect than temperature alone.

Calves that are both weaned and shipped at the same time shrink more than those that are weaned and adjusted to hay before they were shipped. Calves brought in from the range, taken off their mothers, vaccinated, and loaded for shipment within the same operation have all those conditions of stress to make them shrink excessively.

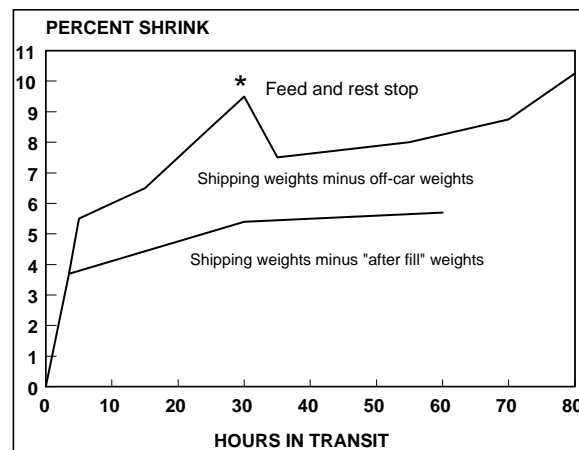
In some cases, physical differences of animals also cause a difference in shrinkage. The difference in shrinkage between heifers and steers have varied with conditions. Prediction of comparative shrink for heifers and steers is difficult. Bulls usually shrink substantially because of travel-related stress. Calves are also heavy shrinkers, largely because they are often weaned at market time. Studies have shown that there is not much difference, however, in shrinkage between the different breeds.

When it is necessary to haul cattle long distances to market or to the feeding area, there is not only a greater transportation cost, but also greater costs as the result of shrinkage. Figure 1 shows that cattle lose the most weight during the second or third hour in transit. After this, shrinkage continues, but at a declining rate. On the average, shrink will increase up to about 9 or 10 percent by the time the first feed and rest stop is made. This stop usually cuts the shrink back to about 7.5 percent. Weight loss will then continue until animals have lost between 10 and 11 percent of their shipping weight by the second feeding and rest stop, which is about 80 hours after shipping.

Time for "fill back" pays off most for cattle in transit over ten hours, but it also decreases the shrink loss substantially if cattle have been in transit for only two hours.

The time required to regain the intransit weight loss will vary considerably. A study to determine this was done by Iowa workers on both feeder calves and yearlings. The yearlings weighed an average of 673 lbs. and the calves 504 lbs. The cattle were purchased in seven

states and hauled an average of 660 miles. During shipment the steers lost 9.62 percent of their preshipment weight. The calves lost 9.49 percent. The yearlings required an average of 16 days and the calves 13 days to recover the weight loss. Another study by the same workers was conducted to determine what type of shrink occurred during long shipments of feeder cattle. In this study, yearling steers were trucked from Texas to Iowa. The weight loss during transit was 8.83 percent. Approximately 47 percent of this loss was accounted for by loss of materials from the digestive tract or excretory shrink. The remaining 53 percent was from tissue weight loss.



Body weight losses during transit are also caused by the stressors to the animals. Loading, unloading, jolting about in a moving truck or rail car, change of environment, and different handlers produce nervous disturbances in animals which cause not only belly shrink but tissue shrink as well.

Finished cattle have a lower shrinkage percentage than range cattle. Highly finished cattle shrink less than those with less finish. Shrinkage does not seem to be closely associated with weight of cattle except as the weight is correlated with degree of fatness.

How to Prevent Shrinkage During Transit:

Usually, you cannot do much about the price when you are selling or buying livestock, but there are some things you can do to eliminate shrinkage losses. Some conditions are beyond the control of shippers. However, you might have some control over other unusual conditions that affect shrinkage if you plan carefully and manage the marketing job properly.

Look into weather forecasts when planning cattle shipments, and prevent rough handling, poor feed, dirty water, excessive delays enroute or at the market, and avoid breakdown of equipment. Give attention to loading shoots, holding pens, scales, trucks and road conditions. This will often pay off with less shrink. Avoid overloading. Overcrowding causes uneasiness, nervousness and sometimes animals get down on the floor and are unable to get up. This causes bruising, crippling, and

occasionally smothering. Partitions will relieve overcrowding pressures in large trucks or rail cars. Underloading also causes excessive movement and banging around which add to heavy shrinkage.

Keep shrinkage at a minimum by providing adequate protection from extremely cold, warm, or wet weather. Covered trucks, weather-stripped rail cars, proper bedding, and shade all help.

Do not overfill cattle before hauling. Chances are they will be discounted for overfilled stock. Be sure animals have a good dry hay ration before being shipped, and avoid extremely washy, lush feeds. Take full advantage of rest stops, and provide the cattle with good fresh hay and water.

Before shipping calves, some ranchers go to considerable expense to prepare them for shipment to assure their top condition at the destination. They wean, vaccinate, and condition them to hay over a period of several days or weeks. Unquestionably, calves will arrive at the market in better condition if they have been weaned and fed hay before shipment. The economic question is whether this cost is covered by higher prices paid by the buyer. Some tests have shown total shrink is the least when weaning and shipment occur at the same time. Calves are upset by both—the combined operation results in heavy shrinkage—but it is over within a short period of time.

Avoid Excessive Shrinkage

Producers or feeders are usually at a disadvantage when bargaining with buyers on shrinkage and weighing conditions. They usually make only few sales or purchases a year, and in most cases have no records on the normal amounts of shrink to expect. The professional buyer, on the other hand, handles cattle constantly under conditions which allow him to learn much about shrinkage. Producers and feeders should have in mind what actual shrinkage losses do occur and under what conditions.

There are a number of ways in which shrinkage can become excessive. In many areas it is customary to hold cattle in drylot overnight and weigh them early in the morning. In other places a pencil shrink—a percentage discount from the weights to determine sale weights—is used. Depending on the area, pencil shrink varies from 2 percent to occasionally 5 percent.

Many ranchers and feedlots do not have weight scales handy and must move stock to where they can weigh them. These short trips from ranch or feedlot to the scale also involve shrinkage.

Author:

Roger Brownson, Extension Livestock Specialist, Montana State University

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If “pencil shrink” is applied on weights obtained at a point some distance away, a double shrink will occur. It has been found that the larger shrink occurs during loading, unloading, and in the first hour of hauling. The shrink increases at a slower rate with additional miles. Thus, even though you may be a short distance from a scale, if animals must be loaded and unloaded and hauled, the shrinkage will be significant.

Another situation which might increase shrink occurs when the animals are loaded and delivered as early as possible in the morning, before they are fed. An overnight stand could cause an additional 2 percent shrinkage. Consider the hypothetical situation in which a rancher or feeder loads his cattle early in the morning after an overnight stand and hauls them six miles to a scale. He could also expect a 2 percent shrinkage loss because of the overnight stand. If a 3 percent pencil shrink were added to this, it becomes obvious how shrinkage becomes excessive. Consequently, the seller should plan his selling and shipping program carefully. The custom of specifying a pencil shrink was developed in lieu of the overnight stand without feed and water.