

# Liver Abscesses and Feedlot Performance

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## Story in Brief

A summary of 11 feeding trials over a 5- year period suggests that only severe liver abscesses reduce feedlot performance. Twenty-four percent of the cattle fed had liver abscesses but only 6.5 percent had severe infections. Severely abscessed animals gained 5.2 percent slower and had a lower dressing percent than non-abscessed cattle fed the same ration. Cattle with liver abscesses at slaughter had more rapid rates of gain early in the feeding period, however, rate of weight gain after 56 days on feed was depressed, especially for cattle with severe abscesses.

## Introduction

Liver abscesses in feedlot cattle have been attributed to an abrupt increase in intake of high energy feeds (Brown *et al.*, 1973). The bacteria, *Spherophorus necrophorus*, a rumen microorganism, is found in abscesses and is implicated as the causative organism. These bacteria enter the portal blood stream through lesions in the rumen wall and proceed to the liver (Smith, 1944).

Liver abscesses are a problem in feedlot cattle throughout the nation. A summary of over 42,000 cattle from the Great Plains showed a liver abscess incidence of 32.9 percent (Montgomery, 1979). Feeding of antibiotics usually reduces the incidence of liver abscesses. The effect of abscesses on feedlot performance according to different reports can range from no effect (Bohman *et al.*, 1979) to a depression in daily gain of over 5 percent (Foster and Woods, 1970). Abscesses vary in number and size. Severity can range from a minor white spot to an open wound. This report summarizes data from a series of trials at OSU in which liver abscesses were not the topic of the research trial but were recorded at slaughter. The incidence and severity of liver abscesses were related to performance and carcass characteristics of individual feedlot steers and heifers.

## Materials and Methods

Data from 11 feeding trials from 1975 to 1979, which used a total of 84 different rations and 2055 steers or heifers, were summarized to determine the effects of liver abscesses on performance and carcass characteristics. Each ration was fed to 16 to 50 growing cattle. All rations were high in concentrate and generally were based on corn grain in the dry rolled, high moisture or steam flaked form. At slaughter, each liver was examined and scored for liver abscess. The scoring system has been described previously (Elanco, 1974). A score of 1 was given for one minor spot no larger than 1 inch in diameter, whereas several large or open sores received a score of 3. Animal performance and carcass characteristics were compared only with cattle in the same trial fed the same ration to avoid the possibility that certain rations might increase both rate of gain and liver abscess incidence.

## Results and Discussion

Averaged over all rations, the incidence of liver abscesses was 23.5 percent. The percentage of animals with abscess scores of 1, 2 and 3 was 10.4, 6.6 and 6.5 percent, respectively. Averaged across abscess scores, liver abscesses reduced daily gain for the total finishing trial by 0.9 percent (Table 1). This reduction in gain occurred during the latter phase of the feeding period (2.8 percent reduced gain). Animals which had liver abscesses at slaughter gained 3.9 percent faster the first 28 days than respective control animals. Reduced performance of animals with severe abscesses during the last phase of the finishing period nullified the rate of gain advantage seen the first 28 days.

Performance of steers with a liver abscess score of 3 was depressed much more than for lesser scores (Table 2), with total trial daily gain 5.2 percent below animals fed the

**Table 1. Performance and abscess incidence.**

|                               | Incidence         |                   |
|-------------------------------|-------------------|-------------------|
|                               | Absent            | Present           |
| Cattle                        | 1571              | 484               |
| Daily gain                    |                   |                   |
| 0-56                          | 3.67              | 3.71              |
| 56-end                        | 2.90 <sup>a</sup> | 2.82 <sup>b</sup> |
| 0-end                         | 3.22              | 3.19              |
| Dressing, %                   | 60.98             | 60.98             |
| Rib eye area, in <sup>2</sup> | 12.25             | 12.16             |
| Fat over rib, in              | 0.57              | 0.57              |
| Grade <sup>c</sup>            | 12.66             | 12.61             |
| Cutability, %                 | 49.24             | 49.17             |

<sup>ab</sup>Means with different superscripts differ significantly ( $P < .10$ ).

<sup>c</sup>Good plus = 12; low choice = 13.

**Table 2. Performance and abscess severity.**

|                               | Abscess score |       |       |                    |
|-------------------------------|---------------|-------|-------|--------------------|
|                               | 0             | 1     | 2     | 3                  |
| Cattle                        | 1571          | 214   | 136   | 134                |
| Daily gain                    |               |       |       |                    |
| 0-56                          | 3.67          | 3.69  | 3.67  | 3.70               |
| 56-end                        | 2.91          | 2.97  | 2.79  | 2.62 <sup>a</sup>  |
| 0-end                         | 3.24          | 3.29  | 3.16  | 3.07 <sup>a</sup>  |
| Dressing, %                   | 60.98         | 61.33 | 60.92 | 60.30 <sup>a</sup> |
| Rib eye area, in <sup>2</sup> | 12.27         | 12.21 | 12.20 | 12.23              |
| Fat over rib, in              | 0.56          | 0.59  | 0.53  | 0.54               |
| Grade <sup>b</sup>            | 12.67         | 12.67 | 12.68 | 12.58              |
| Cutability, %                 | 49.27         | 48.98 | 49.47 | 49.56 <sup>a</sup> |

<sup>a</sup>Significantly different from non-abscessed control animals ( $P < .03$ ).

<sup>b</sup>High good = 12; low choice = 13.

same ration which had no abscesses. The final 90 days of the feeding period accounted for the reduced trial gains. During the latter phase, gains were 4.1 and 9.9 percent slower for animals with liver abscess scores of 2 and 3, respectively. These data suggest that the adverse effects of liver abscesses on performance are evident only after 56 days on feed. Possibly animals which consume large amounts of feed and make rapid gains may overeat and be more susceptible to severe liver abscesses. Alternatively, the presence of minor liver damage might stimulate the immune system and increase animal performance.

The most severe abscess score was associated with a reduced dressing percentage (0.7 percentage points) and increased cutability (0.29 percentage points). The lower gains and carcass weights of abscessed cattle may account for the slightly lower dressing percentage, fat thickness and increased cutability.

### Literature Cited

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## Influence of Roughage Level and Feed Intake Level on Digestive Function

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### Story in Brief

The effects of roughage level and feed intake on site and extent of digestion were studied with three Angus steers equipped with dual re-entrant cannulas in the small intestine. The three treatments consisted of: 1) low roughage ration (20 percent hay, 80 percent concentrate) fed at 1.5 percent of body weight per steer daily, 2) this low roughage diet fed at 2 percent of body weight and 3) a higher roughage ration (40 percent hay, 60 percent concentrate) fed at 2 percent of body weight. Increasing roughage in the diet increased ruminal digestion and depressed intestinal digestion.