

# Sonographic Appearance of Injection and Natural Edema in the Udder of Show Cows

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## Introduction

Informal reports indicate that foreign materials are injected into sites of fore and rear udder attachment of show cows to augment the contour of the udder. These substances cause localized edema. This study evaluated the sonographic appearance and pattern of distribution of edema produced by subcutaneous injection with mild silver protein suspension compared to natural causes.

## Materials and Methods

The three subgroups which received udder sonographic examination and mapping of the distribution of edema were 1) injection, 2) postpartum, and 3) over-bagging. Six commercial milking Holstein cows were injected subcutaneously into fore and rear quarter attachment sites with a mild silver protein. The cows and number of quarters per cow injected were randomly assigned. The number of injections and volume injected were based on the appearance of each cow and the desired subjective visual effect. Seventeen sites were chosen for injection and seven sites were not injected. Cows were imaged one day prior to and six days after treatments were started. Cows were injected one, three and five days after initial imaging. The sonographer was blinded to which cows and sites within each cow were injected. The second group included seven cows from a local dairy herd which had freshened 1 to 16 days previ-

ously. The third group was comprised of cows from a local show, with no evidence of injection edema and which had not been milked between 20 and 30 hours prior to the study.

## Results

The sonographic appearance of edema in cows from all groups was similar and appeared as a pattern of alternating hypoechoic and hyperechoic bands. Edema from over-bagging and postpartum had similar patterns of distribution. Perivascular injections in cows from the injection group caused a corrugated appearance to the intimal surface of the subcutaneous abdominal vein. In cows from the injection group, all sites were correctly identified sonographically (100% sensitivity, 100% specificity). The pattern of distribution for edema from cows in the injection group rarely overlapped with over-bagging and postpartum group cows.

## Conclusions

Results suggest that mild silver protein suspension injected subcutaneously to enhance the appearance of the udder of show dairy cows can be readily detected by ultrasonography. The detection of injection sites in show cows is dependent on both the distribution and sonographic appearance of the edema.