

# WHAT CAN YOU LEARN FROM A LIVING COW LIVER BIOPSY?



by: REDMOND MINERALS

At first, the idea of taking a tissue sample from an internal organ may sound risky and expensive. In reality, living liver biopsies are simple, affordable, low risk, and deliver a significant return on investment. The results can help guide you to spend money in the right places.

## How Do Living Cow Liver Biopsies Work?

Liver biopsies can be performed directly in the chute during normal processing. The area of incision is prepped like a surgery, with shaving, sterilizing, and lidocaine application. A tiny incision is made in the hide; too small to even need a suture. A specialized biopsy needle is then inserted. This needle has an internal cutting mechanism that removes and stores the small sample within the needle for easy removal. The sample is then sent to your local ag lab for analysis.

## Why the Liver?

Livers are ideal organs for living biopsies because they are the most regenerative organ in the body. Liver tissue can grow back faster and healthier than other organ tissues so taking a small sample does not harm liver function at all. They are also living storage compartments. According to the National Institute of Health: *“Liver is a major storage organ for trace elements and heavy metals, and element concentrations in the liver therefore reflect exposure levels. Element concentrations in the liver are interpreted as deficient, adequate, high or potentially toxic based on the age category of the animal.”*

## What Can I Learn From A Liver Biopsy?

### Liver Fat Content

A healthy liver stores very little fat for its own use. It does transport fat by producing special proteins (lipoproteins) to carry important fatty acids from the liver to tissues throughout the body. According to the Merck Veterinary Manual: *“fatty liver results from a state of negative energy balance and is one of the important metabolic diseases.”*

### Hepatic (Liver) Diseases

Identifying hepatic diseases early is essential because they can easily spread through a herd. By the time you notice physical symptoms or problems in your herd, your production levels will suffer before corrections can be made.

### Mineral Levels

Liver biopsies are more detailed and accurate than blood serum samples. Dr. Jeffery Hall from the Utah Veterinary Diagnostic Laboratory, compared 10 paired liver and blood serum samples. All 10 liver biopsies showed copper deficiency, whereas only 1 of their serum matches tested as deficient.

Liver biopsies offer a more complete diagnostic for minerals like copper, calcium, cobalt, iron, manganese, magnesium, sodium, potassium, selenium, zinc, and more.



## Redmond Supports Healthy Mineral Levels

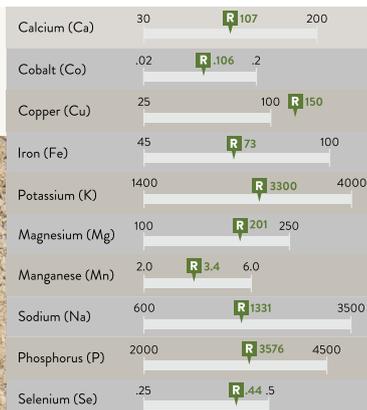
We often hear from farmers that their animals *“just do better on Redmond.”* Redmond has supported healthy farming operations for over 50 years with our unique blend of 60+ natural trace minerals. Our mineral salts and clay conditioners offer an expansive nutrient profile to improve overall herd health. Take a look at what a cluster of liver biopsies revealed about cows eating Redmond minerals!

Low salt/heavy mineral mixes taste extremely bitter and are not necessary to help resolve mineral deficiencies. Fortunately, our higher salt to mineral ratio ensures even your most stubborn animals will crave and enjoy eating their minerals.

## Dairy Liver Biopsy

Data is an average from four dairy herds (2,200 cows)

Redmond (ppm) Expected Range (ppm)



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