

Liver Copper Analysis

SAMPLE REQUIRED:

Fresh / frozen / formalin fixed** tissue
Preferably > 100 mg wet weight (preferred
minimum 30 mg wet weight)

TUBE REQUIRED:

Plain (non-additive) tube/vial

Test Use

Copper can accumulate in hepatocytes due to excessive dietary intake, cholestasis or altered hepatocyte metabolism preventing copper excretion. Excessive intracellular copper can result in cellular damage due to formation of oxygen free radicals.

Copper associated chronic hepatitis has been documented in Bedlington Terriers, Doberman pinschers, Cocker spaniels, West Highland white terriers, Standard poodles, Dalmatians, English Springer spaniels, Samoyeds, Cairn terriers, Skye terriers, Anatolian Shepherd dogs, Welsh Corgis, Keeshonds, Great Danes and Labrador retrievers. Inherited disorders preventing hepatic copper excretion have been proven in both the Bedlington terrier and Labrador retriever, although an inherited defect is suspected in many other breeds.

Protocol

Fresh chilled liver is the preferred sample. Samples should be placed into containers suitable for the sample size and chilled as quickly as possible.

For samples collected at post mortem, a sample size of 5 - 10 g in a 50 mL plastic screw-top container is preferred. Fresh tissue samples should be frozen if shipment will be delayed more than 2-3 days. Frozen samples are stable for several months. Extensive autolysis of liver samples may result in reduced mineral concentrations in the tissue.

For biopsy samples, a minimum biopsy weight of 100 mg is requested. Smaller samples can still be processed; however, biopsy samples <30mg require a different assay method/QC and are approximately twice the price of routine assays.

Biopsy samples must be gently rinsed with saline and excess fluid/blood removed by gently blotting with lint-free tissue or gauze swabs. Place the sample into a 1.5 mL 'O'-ring sealed plastic vial/tube. The entire contents of the biopsy vial, including any water condensate from the biopsy, will be assumed to be liver; therefore, it is vital that clots and excess blood/fluid are removed from the initial sample.

**Formalin fixed tissue samples may also be used for copper estimation, provided samples are of sufficient size to allow trimming of all external tissue surfaces.

Notes

- Results are reported as SI units of mmol per kg wet weight. For an approximate conversion to dry weight, multiply result by 3.6. For conversion to mg per kg wet weight, multiply mmol per kg wet weight by atomic weight of element (63.5 for copper).
- If liver copper/B12/GSHPx is required, then minimum biopsy size is 100 mg. If Manganese is also required then minimum biopsy size is 250 mg. If Selenium required vs GSHPx, minimum biopsy size is 500mg.
- If iron is required a separate biopsy (minimum 30 mg) is needed.