# Kelp and Dairy Cattle - A Pilot Study

By Dr. Richard Olree and Dr. Paul Dettloff

After observing positive results of kelp in the ration of many transitioning and organic herds, the question remained, what does kelp do to the long term mineralization of the animal?

Kelp has a plethora of trace elements that are instrumental in maintaining health and highly available because they are in a colloidal form. Plants use inorganic minerals and take carbon dioxide from the air and place that carbon molecule within the mineral complex making these same minerals organic by which man and animals can now use. Logically, immune and reproductive systems now can function better. However there is no published research indicating what is happening to the cattle's mineral reservoirs.

Dr. Paul Detloff and Dr. Rich Olree did a pilot study using hair samples of 8 cows to determine the measurement of trace minerals as found in dairy cows that have utilized kelp and those that have not. Four farms were selected for the study. Two certified organic farms utilizing kelp and two conventional farms not using kelp. One from each category of the farms was analyzed from two different states, namely Michigan and Wisconsin.

Both organic herds were grazing herds with high pasture intake in the summer. Winter rations also maintained approximately 75% high forage diet. Both organic herds had been using a soil fertility program that was following the Albrecht method.

As ocean waters become more polluted as seen from the gulf oil spill, it becomes harder to obtain clean kelp. Kelp has been added to dairy cattle for some time for their trace minerals.

All cows that were using kelp had been using it for several months if not all their lives since weaning prior to the pilot study. The Michigan herd had been fed North American Kelp free choice all the time. During the winter, 1½ to 2 oz. of kelp was the average amount eaten. The Wisconsin herd had been fed Thorvin Kelp having 1½ oz. in the ration and was free choice also. Young stock always had access to kelp it from birth on. Both herds noted eating less kelp in the summer when on pasture.

The conventional herds had no kelp but were fed a buffer to help the rumen maintain its proper pH. No buffer was in the organic diets. The seed-forage ratio in the conventional herds was 50-50. Possibly more grain on the top high producing cows.

Milk production in the conventional herds was in the mid 20,000 pound range. The Wisconsin herd peaked at 27,000 pounds of milk per cow per year. Both grazing herds milk production was in the high teens in.

Conventional herds were confined and ate no grass. The cows selected were all healthy and were from 5 to 7 years old. Minerals like calcium and phosphorus were fed to all herds as per nutritionist recommendations.

Hair samples were all taken from the same spot on the cow's body, just below the poll on the top of the head. The hair was brushed to remove any dirt and debris to avoid contamination. Samples were sent to Doctors Data Inc. in St. Charles, Illinois, a company that has been analyzing human hair samples for over twenty five years and has a reliable track record. Minerals tested are broken down into essential and potentially toxic categories by the lab.

Benefits commonly seen and reported by kelp users include stronger heats and higher conception rates, lower somatic cell count, reduced lice problems (especially in young animals but also on adults), less fly pressure (as flies don't particularly like long term kelp fed cows), possible iodine presence, less internal parasites, less occurrence of pinkeye (especially in young stock on pasture), foot and hoof problems improve.

Long term kelp fed cows show a shiny, shorter hair and shed their winter coat earlier. Happy lines and Thymic swirls in coats at the base of the neck indicate a well functioning endocrine system.

Thirty nine essential and potentially toxic minerals measured were: Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Germanium, Iodine, Iron, Lead, Lithium, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Phosphorus, Platinum, Potassium, Rubidium, Selenium, Silver, Sodium, Strontium, Sulfur, Thallium, Thorium, Tin, Titanium, Uranium, Vanadium, Zinc and Zirconium.

**Reading the graph:**

- Desired results for the potentially toxic mineral graph should be in the green area or further left of least toxicity.

- The essential mineral graph should be in the 50th percentile or above. See the sample graph below.

# HAIR ELEMENTS

DOCTOR'S DATA INC

LAB#: H100409-2116-1
PATIENT: 907- Werth Cow
ID: 907- WERTH C--00001
SEX: Female
AGE:

CLIENT#: 11528
DOCTOR: Richard N. Olree, DC
Olree Chiropractic Center
311 N State St/po Box 550
Hillman, MI 49746 USA

## POTENTIALLY TOXIC ELEMENTS

| TOXIC ELEMENTS | RESULT µg/g | REFERENCE RANGE |
|---|---|---|
| Aluminum | 34 | < 7.0 |
| Antimony | 0.018 | < 0.050 |
| Arsenic | 0.13 | < 0.060 |
| Barium | 1.0 | < 2.0 |
| Beryllium | < 0.01 | < 0.020 |
| Bismuth | 0.013 | < 2.0 |
| Cadmium | 0.040 | < 0.050 |
| Lead | 1.5 | < 0.60 |
| Mercury | < 0.03 | < 0.80 |
| Platinum | < 0.003 | < 0.005 |
| Thallium | 0.007 | < 0.002 |
| Thorium | 0.011 | < 0.002 |
| Uranium | 0.032 | < 0.060 |
| Nickel | 0.28 | < 0.30 |
| Silver | 0.01 | < 0.15 |
| Tin | 0.05 | < 0.30 |
| Titanium | 2.1 | < 0.70 |
| Total Toxic Representation | | |

PERCENTILE: 68th, 95th

## ESSENTIAL AND OTHER ELEMENTS

| ELEMENTS | RESULT µg/g | REFERENCE RANGE |
|---|---|---|
| Calcium | 1970 | 300- 1200 |
| Magnesium | 660 | 35- 120 |
| Sodium | 1300 | 20- 250 |
| Potassium | 2300 | 8- 75 |
| Copper | 16 | 11- 37 |
| Zinc | 250 | 140- 220 |
| Manganese | 4.3 | 0.08- 0.60 |
| Chromium | 0.88 | 0.40- 0.65 |
| Vanadium | 0.093 | 0.018- 0.065 |
| Molybdenum | 0.27 | 0.020- 0.050 |
| Boron | 3.5 | 0.25- 1.5 |
| Iodine | 1.1 | 0.25- 1.8 |
| Lithium | 0.060 | 0.007- 0.020 |
| Phosphorus | 299 | 150- 220 |
| Selenium | 3.3 | 0.55- 1.1 |
| Strontium | 1.3 | 0.50- 7.6 |
| Sulfur | 38100 | 44000- 50000 |
| Cobalt | 0.085 | 0.005- 0.040 |
| Iron | 68 | 7.0- 16 |
| Germanium | 0.042 | 0.030- 0.040 |
| Rubidium | 1.2 | 0.007- 0.096 |
| Zirconium | 0.15 | 0.020- 0.42 |

PERCENTILE: 2.5th, 16th, 50th, 84th, 97.5th

## SPECIMEN DATA

COMMENTS: Cow hair- Reference Ranges not established

Date Collected: 4/5/2010
Date Received: 4/9/2010
Date Completed: 4/15/2010
Client Reference:
Methodology: ICP-MS

Sample Size: 0.198 g
Sample Type: Head
Hair Color: Brown
Treatment:
Shampoo:

V010.08

## RATIOS

| ELEMENTS | RATIOS | EXPECTED RANGE |
|---|---|---|
| Ca/Mg | 2.98 | 4- 30 |
| Ca/P | 6.59 | 1- 12 |
| Na/K | 0.565 | 0.5- 10 |
| Zn/Cu | 15.6 | 4- 20 |
| Zn/Cd | > 999 | > 800 |



**A sample report from the Pilot Study**

**Comparative analysis:**

1. Aluminum – The inorganic cows combined had a 26% increase levels of aluminum. This becomes important later when the boron results are explained. Aluminum and boron have the same electron charge but aluminum will drive down boron and the lack of boron will let aluminum rise up in a biological being.
2. Antimony – All antimony levels in the organic cattle were within normal human values. However, the inorganic cattle had 16% more antimony in the hair samples and were in the yellow precautionary level. Antimony is a byproduct of the plastic container industry. The longer fluids are contained in plastic, the greater the amount of antimony, including bottled drinking water. Antimony competes with nitrogen in the small intestine and may alter the probiotic count.
3. Arsenic – All cattle arsenic levels were in the yellow precautionary level. Organic cows however were 45% lower than conventional cows.
4. Barium – Levels jumped around a lot, but the clear average belongs to the organic cattle, a 71% decrease in barium levels compared to conventional levels. Barium should not be found in any quantity in either human or cattle.
5. Beryllium – Beryllium was not detected in any of the cattle tested.
6. Bismuth – All cattle levels of bismuth were quite low and in good standings. Organic cows fared better by having 22% than conventional cows.

7. Boron – Boron has become indispensable on the fields of the organic farmer. It is easily washed away and a plant cannot grow without this mineral. Human research is just starting to catch up with this most important mineral. It has been shown that boric acid has well-defined biological effects such as stimulation of wound healing in vivo, release of growth factors and cytokines, an increase of the extracellular matrix turnover. The only type of boron that is the safest is labeled Calcium Fructoborate. This is the only product that one should see fructose on any label. Dr. Olree predicts in the future, the organic source of boron for the cattle will be Calcium Fructoborate. Organic cattle had an average of 152% higher levels than conventional cattle. This difference may account for the high aluminum levels in conventional cattle.
8. Cadmium – All cadmium levels were in the green to yellow precautionary levels in both organic and conventional cows tested. The average was 25 % lower in the organic cattle. This difference may be why selenium is slightly lower.
9. Calcium – There was only a 3 % difference in calcium levels with conventional having the edge in amount detected in the hair.
10. Chromium – Chromium levels were 45% higher in the conventional cattle as compared to organic cattle. All levels in the organic cattle fell in the normal range while the conventional cattle fell within the red line toxicity levels for humans.
11. Cobalt - Cobalt levels were 36 % higher in the conventional cattle as compared to organic cattle. All cobalt levels fell in the normal range. Cobalt is the link to absorbing germanium, vanadium, iron, copper, zinc, manganese, nickel and molybdenum.

12. Copper – Two of four conventional cows fell in red line deficiency levels for humans, while two conventional cows were normal as well as two of the organic cows. Two organic cattle were in the low yellow precautionary levels for humans. Copper levels should be researched and may have to be adjusted to meet the cattle demands.
13. Germanium –inorganic cattle were all in the high red precautionary levels where as three of organic cattle were in the normal range with one in the yellow precautionary level.
14. Iodine – This is the most important mineral in the human or cattle. The most important hormone in the body is the thyroid hormone and the thyroid needs iodine. It doesn't get more basic than this. The organic cattle had 8,405.5% more iodine than conventional cattle. That's correct, eight thousand, four hundred and five point five percent more iodine in the organic cattle. One has to pity the conventional milk drinker or conventional dairy farmer.
15. Iron – Conventional cattle had 55% higher iron levels as compared to organic cows. All iron levels in both the conventional cattle and the organic cattle are in the high red line toxicity levels. This may reveal insight with the high number of humans that have hemocromatosis, an abnormally high level of iron in blood. The organic cattle are 55 % lower and less likely to offer iron overdose.
16. Lead – Lower selenium in the organic cow may due to the removal of lead. Organic cattle have 79% less lead in their hair.
17. Lithium – Manic and depressed humans have a much greater need for lithium. Lithium keeps us happy. Organic dairy cows have on an average 49 % more lithium in their hair! Is it possible that organic cattle are happier?
18. Magnesium – There was very little difference in magnesium between the two groups of cattle with conventional having 5% more in their hair.
19. Manganese – All were in the upper limits of the red line with organic cattle being 33% lower levels. These levels should carefully be looked at. The copper to manganese ratio's are too important to ignore. More research should be done.
20. Mercury – No mercury is good. All samples were in the good zone, with very little detected.
21. Molybdenum – All molybdenum levels were in the red zone except for one conventional cow that was in the upper yellow precautionary levels. Organic cattle had 183% more molybdenum than conventional cattle. All sulfur levels in both groups are at or near the red line of deficiency status. Molybdenum may be competing with sulfur and causing this seemingly imbalance.
22. Nickel – All animals tested were in the normal range with one conventional cow into the yellow precautionary level. Organic cattle had 37% less nickel in tests.
23. Phosphorus – All tests were in the red toxic levels. Organic cattle had 26% less phosphorus. This may have implications that should be evaluated in relation to calcium for bone formation.
24. Platinum – All cattle tested had little or no platinum. All values were equal.
25. Potassium – All potassium levels were in the red line for human comparison. Organic cattle had 38% more potassium than inorganic cattle.

26. Rubidium – Rubidium levels were either in the yellow precautionary or toxic red line levels. Organic cattle have 77% more than conventional cattle. The reason for these levels being so high in organic is due to the fact the cows have so much iodine in there system. Rubidium sticks to iodine like sodium to chloride. It's not bad to have good rubidium levels. Rubidium follows that potassium pathway and mobilizes the lithium in a biological brain.
27. Selenium – Organic cows did not fare as well on the selenium hair levels. Organic Selenomethionine is much more bio-available than sodium selenate and is put into the milk for the calf's benefit. Sodium selenate, an inorganic selenium source is frequently used in supplemental feed rations and will build up in biological systems until the inorganic selenium is converted to organic, thus recording a higher selenium level in the test results. Lower levels also could be relative to lower levels of all toxic metals as selenium is the main pathway out of the biological system.
28. Silver – Very little silver was detected in any sample. However, there was 66% more in organic cattle.
29. Sodium –30% more in organic cattle than conventional cattle. All cattle tested were in the toxic red line area. As with rubidium, the electron charge is positive one and iodine is negative one. This may account for sodium being high as well as high in the sea kelp that the cattle are being fed.
30. Strontium – Strontium stimulates stem cells to become bone cells. Conventional cattle seem to show 4% more strontium than organic cattle. All levels were in the normal range.
31. Sulfur – For reasons unknown by the authors all cattle tested are in the red line deficient state with organic fairing only 4% better than conventional cattle.
32. Thallium – Very little thallium was detected, however organic cattle had 77% less thallium that the conventional cattle.
33. Thorium – The devil is in the paper work. This mineral took us by surprise as there should be none found. Highly radioactive we found this mineral in all cattle from two different states in the red line of toxicity with organic cattle having 28% less in their hair content. It is not a mineral that would normally be in the soil so it must be falling from the sky? Dr. Dan Skow has postulated that it may be from a desert in China that seems to be getting bigger and bigger all the time. The dust from this desert may be a worldwide phenomena and in speculation, we think that this where Thorium is coming from. This finding of high Thorium if consistent needs to be confirmed.
34. Tin – Often found in small amounts in many plants according to Dr. James Duke . Tin levels in conventional hair samples were 43% lower in the kelp organic cows.
35. Titanium – Titanium seems to be everywhere, it is the chief pigment of white paint and is found in most if not all calcium supplements sold in the big megamarts. It has been shown to unravel the zinc fingers that hold DNA together. The organic cattle had yellow precautionary levels where as the inorganic cattle were all in the red line toxic levels. Organic cattle contained 41% less titanium levels.
36. Uranium – There was very little uranium found within the samples tested. Organic cattle fared better with 44% less uranium in samples.

37. Vanadium – If Mr. Spock from Star Trek has green blood it would be vanadium instead of iron that carried oxygen as evident from a lizard found in the Galapagos Islands. The creature has green blood instead of red hemoglobin. Organic cattle contained 38% more vanadium. Current knowledge is that vanadium is utilized to help control blood sugar.
38. Zinc – The zinc levels belong to the conventional cattle with 31% more than organic cattle. All levels were normal. Zinc is the glue that holds the coil of DNA together.
39. Zirconium – Conventional cattle contain more zirconium than organic cattle for reasons the authors cannot comment on. There is 73% more of this mineral in the conventional cow. There are no reasons for this mineral to be present that we know of. All samples were within the normal range.

**In summary**:

Of the 22 Essential Elements tested, seven were at higher levels on kelp rations; six were at the same levels. Sodium was much higher in the non-kelp group due to feeding buffer, and the rest showed no changes and were over the 100%. Sulfur was very low in every cow. The numbers do reflect some positive differences. The main difference is how the cows look and perform. The visual differences are usually quite dramatic.

17 Potentially Toxic Elements
Aluminum: 3 cows redlined on aluminum - 2 conventional and 1 organic.
Antimony: No differences noted
Arsenic: Kelp cows higher/one redlined on Arsenic. Possibly because Pine trees are close (Pine trees raise arsenic levels)
Barium: One kelp cow redlined on Barium (same cow redlined on aluminum)
Beryllium, Bismuth, Cadmium, Mercury, Platinum were all good levels with no differences noted in kelp versus non-kelp diet.
Lead: One kelp cow was at 98% - all others low with no differences
Thallium: No differences - all in 90-95% range
Thorium: This concerns both doctors doing the analysis as only two cows didn't redline Thorium, and these two were over 95%. (one on kelp and one not) Thorium is radioactive. Where is it coming from? This is a big question as is this coming from the atmosphere?
Uranium, Nickel, Silver and Tin were all at safe levels and no noted differences on kelp versus non-kelp.
Titanium: Three cows were 98% - 2 kelp and 1 non-kelp. The rest were 85% plus - no differences between groups.

Further research is needed to gain more insight to this field of study.

Dr. Paul Dettloff, D.V.M. does not sell any type of kelp product and Dr. Richard Olree, D.C. has kelp in his product line for human consumption. This pilot study was run out of curiosity of a question that was raised during a private discussion. All testing fees were paid for by Dr. Paul's Lab, LLC.