

## Trace Minerals for California Beef Cattle



**Dan Drake**

Farm Advisor, Siskiyou County

530-842-2711

[djdrake@ucdavis.edu](mailto:djdrake@ucdavis.edu)

Developed by:

- Dan Drake, Farm Advisor, Siskiyou County, Cooperative Extension, UC Davis
- John Maas, Extension Veterinarian, School of Vet Medicine, UC Davis
- Jim Oltjen, Animal Science Department, UC Davis
- Logan Smith, intern and current graduate student UC Davis

URL: <http://animalscience.ucdavis.edu/MineralProject/>

A web site was developed that collected over 20 years of historical research from throughout California on trace mineral status of beef cattle for selenium, copper, zinc and phosphorus. This preserved the data and allowed access by many others, but particularly producers, veterinarians, nutritionists, and other academics. The information is hierarchical, scaling down to mineral values for individual animals (Table 1). The need to produce a relatively standard page format necessitated a coalescing of the data into more uniform reporting methods and an improvement over the widely distributed, highly variable reports spanning numerous researchers. These two needs were resolved by categorizing the data based on the sample collection procedure. Three classes of data were identified: class 1, random samples; class 2, selected samples; and class 3, special or sick animal data. Each of these categories has different ramifications on the interpretation of the summary statistics due to the methods of sample collection. Thus the categorization was critical to help interpret the data. The categorization was also a relatively simple criterion to decide based on the historical reports and facilitated simple uniform reports. Data for individual counties were evaluated by the authors for status: adequate, marginal, deficient or unknown (Figs. 2 & 3). Data itself was assembled by the authors in Excel, permitting easy sorting, simple statistical analysis and importing.

The web site was developed with Microsoft FrontPage augmented with Excel, Word and CorelDraw. It was the first attempt at developing a web site by the authors, although all had used computers extensively. The hosting site is the Animal Science Department, UC Davis. Abbas Ahmadi provided technical support for particularly troublesome programming aspects, and maintains the site. Support from a computer specialist is important for unexpected problems, which were a very



Figure 1. Trace mineral status of beef cattle in California counties was collected into a web page for increased accessibility.

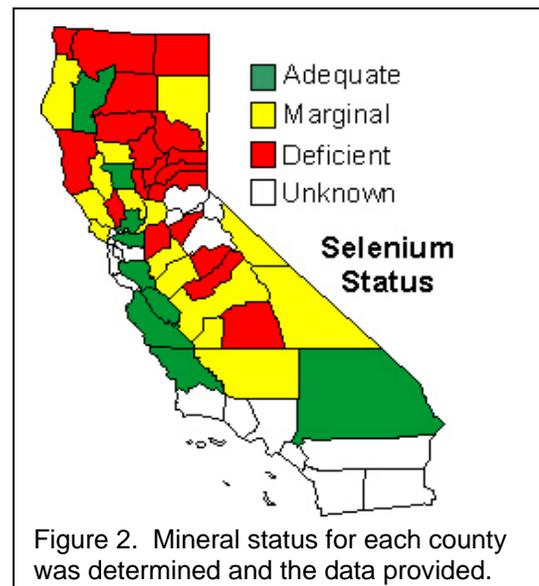
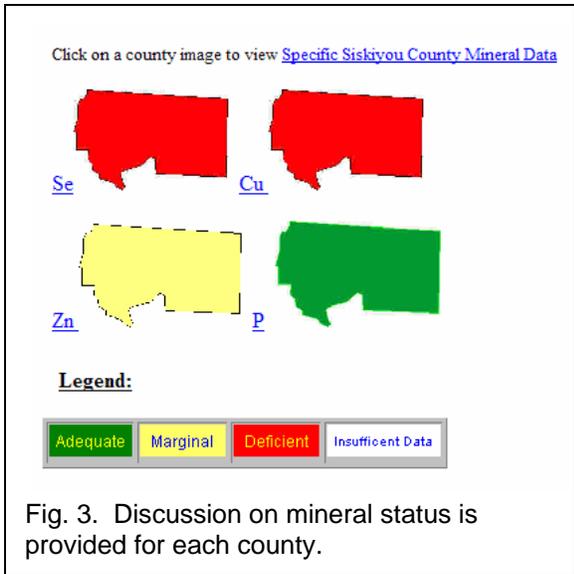


Figure 2. Mineral status for each county was determined and the data provided.



minor component of the total time in preparation, but were potentially significant impediments. Often, workarounds or other solutions to these roadblocks by the authors were possible, but not as effective as those from the computer specialist.

Table 1. Summary statistics facilitate user interpretation and capture the historical details.

<b>Blood samples*</b>				
<b>WEIGHTED AVERAGES</b>				
Se	Cu	Zn	P	
0.036	0.62	1.50	135	<b>All Values</b>
0.036	0.48	no data	no data	<b>Class 1 data only</b> (random samples)
0.028	0.71	1.54	135	<b>Class 2 data only</b> (field trials, selected herds)
0.087	0.63	1.31	no data	<b>Class 3 data only</b> (sick cattle)
<b>Number of Individuals</b> (used in weighted averages)				
Se	Cu	Zn	P	
444	193	76	9	<b>All Values</b>
109	55	0	0	<b>Class 1 data only</b> (random samples)
289	79	61	9	<b>Class 2 data only</b> (field trials, selected herds)
46	59	15	0	<b>Class 3 data only</b> (sick cattle)
<b>Lowest and Highest Values</b> (Individuals only)				
Se	Cu	Zn	P	
0.0090	0.20	0.88	121	<b>Lowest individual value</b>
0.289	1.19	2.48	144	<b>Highest individual value</b>

\* Se whole blood, Zn & P serum, Cu whole blood or serum



**Contact Information:**  
 Dan Drake 530-842-2711  
 djdrake@ucdavis.edu