

Re: Arsenic and cattle

Source: <http://sci.tech--archive.net/Archive/sci.chem/2006-02/msg00202.html>

- *From:* "N:dlzc D:aol T:com \(\dlzc\)" <N: dlzc1 D:cox T:net@xxxxxxxxxx>
 - *Date:* Wed, 15 Feb 2006 06:13:44 -0700
-

Dear Bob:

"Bob" <bbx107@xxxxxxxxxxxxxxxxxx> wrote in message
news:kjf5v1pmtv3ilp19qkkdkp631sbipmv6va@xxxxxxxxxx

On Tue, 14 Feb 2006 20:57:02 -0700, "N:dlzc D:aol T:com
\(\dlzc\)" <N:
dlzc1 D:cox T:net@xxxxxxxxxx> wrote:

I had made an unsupported statement about a year
and a half ago that cattle required a small amount
of arsenic in their diets to survive. I was asked for
any sort of literature support and found very little at
the time.

<http://www.ead.anl.gov/pub/doc/arsenic.pdf>

"Depending on the amount ingested, arsenic can
be beneficial (animal studies suggest that low
levels of arsenic in the diet are essential) or
adverse (high levels can be toxic)."

<http://horse.purinamills.com/bulletins/poison/lamenessinducing.html>

"The toxic effects of selenium in ruminants
varies, depending on the amount and rate of
its absorption, the individual animal's
susceptibility, the type of selenium present in
the plant, and the interaction of selenium with
other elements, such as sulfur, arsenic, or
copper, in the diet. These minerals, and
possibly others, competitively interfere with
selenium absorption by ruminants. If this
also occurs in horses, adequate amounts of
these minerals in their diet may help reduce
selenium poisoning for them, although
currently this hasn't been demonstrated."

Still no real pointers to peer reviewed

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literature... but, if you have healthy cattle, you have some arsenic. This is beef, milk, and ground or surface water near where they "eliminate". And arsenic is not limited to cattle...

I am commenting on this based almost entirely on what you posted above. I have no specific knowledge about arsenic requirements.

Like I do? Understood.

There is nothing wrong with the possibility that something normally considered toxic is also required at low levels. This per se is common enough.

However, the case stated above is very weak.

Agreed. Might not even call it a case...

First, saying that low levels may be "beneficial" does not mean it is "required".

Bob, the quote from the first link (specific to cattle) says "essential". It is an even less formal presentation than the second link, even though the first is a ".gov" link. Essential = required.

Second, if the (only) reason it is beneficial is due to competing with Se, then it would not be required if the Se level were adequate (or low). (And you may know that Se is a good example of an element that is beneficial at low levels, and toxic at higher levels, with a rather low margin of safety between the good and bad levels.) That is, it does not imply a requirement for As per se.

Interesting question. I'd be delighted to see some hard data. But of course, it is very difficult to get hard data on trace nutrients in the real world. Lab work, with rodents eating chemically defined diets, is hard enough!

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For whatever reason, if you are down "stream" of cattle, you have arsenic at elevated levels. I know arsenic is added to chicken feed to keep their intestines clear of parasites. Arsenic can be/is concentrated in vegetables. It *is* trace...

A friend's wife has intestinal polyps. I wonder if arsenic in her diet plays any part in this via keratosis? Danged engineers always have to muck around... sigh.

Thanks, Bob.

David A. Smith