

# FEED BETTER, FEED LESS The financial pinch of a 20% range cube

**Charles Eckel** 

# Lyssy & Eckel Inc.

Lyssy & Eckel Feeds was founded in 1945 by Ed Lyssy and A.W. Eckel Jr.

Their vision holds true to this day:

Provide quality feed with first class ingredients. Assembled with research based formulating. Lead with customer service that treats the customer like they are a part of the family.

We are still a family owned and operated business. Both families are in their third generation of ownership and management.

## When looking at your pasture, what do you see?

- 1. Need to gain weight, maintain weight or lose weight?
- 2. Animals that are fat, thin, pregnant, lactating, freshly weaned, finishing on feed?

### When choosing feed, what do you want to achieve?

- 1. Are you KEEPING or CULLING.
- 2. Do you need a grain feed (starch) or a grain by-product feed (carbohydrate)?



NOT EVERY FEED IS MADE EQUAL. The bacteria of the gut is based around what type of feed you are feeding!



### CARBOHYDRATES GRASS

### **STARCH** *GRAINS*

### Cottonseed Meal, Soybean Meal, Citrus Pulp, Wheat Midds, Corn Germ, Alfalfa Meal

- Pasture Minded (replacement/breeding)
- Grain By-Products
- Pairs perfectly with pasture or hay grazing.
- Maintains balanced pH.
- Maintains weight once off feed and on pasture.
- Less feed per head per day.



### Backgrounding

- Loss of performance
- Loss of weight
- Rumen turnover

### Corn, Oats, Soybeans, Barley, Milo

- Terminal Minded
- Whole grains
- Quick Gain
- Lowers pH
- Not for animals going back out on pasture.
- More poundage per head per day.



# OKLAHOMA GOLD RESEARCH STUDY,

research on yearling cattle on mid-summer harvested prairie grass.

### Oklahoma Gold Q&A

GRAIN	COMPLEX CARBS	PROTEIN
8-10# of feed for 1# of gain	6# of feed for 1# of gain	2.7# of feed for 1# of gain
Textured	20% cubes/growing ration pellets	37% protein supplement
Energy Dense Feed		High Protein Feeds
<ul> <li>High in starch from grains</li> <li>Bulky feedstuffs</li> <li>High in waste.</li> </ul>		<ul> <li>No starches from grains.</li> <li>Feed Less.</li> <li>Harder cube composition.</li> </ul>

# **60:40 Target Ratio** Degradable / Bypass Protein



## **FEED THE RUMEN** the animal will follow

Cottonseed Meal 58:42

Soybean Meal 69:31

**Dried Distillers Grains** 57:43

Feather Meal 15:85

Degradable protein feeds the bacteria in the rumen. This bacteria digests the fiber/roughage in the diet.

Bypass protein goes through the rumen not broken down, and is absorbed in the small intestine as protein.

**Promotes:** 

- 1. Lactation
- 2. Bone Development
- 3. Muscle Development
- 4. Fetal Development
- 5. Overall growth



### Why do we want, degradable and bypass protein?

- 1. The degradable proteins feeds the bacteria of the gut promoting bacterial population growth.
- 1. As bacteria die off, they become microbial protein.
- 1. Microbial protein leaves the rumen and is absorbed in the small intestine as pure protein.

No feed stuff, additive or man made product can match the efficiency and power of microbial proteins.

### Volatile Fatty Acids, your animals source of energy.

- 1. This is the body's source of energy.
- Warmth in Winter More corn does not mean more warmth.
- 1. Hydroxychloride trace minerals play a greater role in VFA production increasing production by up to 22%.



#### Score 2

Runny, does not form distinct pile. Splatters when hitting the ground. Less than 1" in height.

Score 3 Porridge-like appearance. Several concentric rings with a slight depression in the middle. 1.5 - 2" thick.

#### Score 4

Thicker and typically lavs out in folds. Associated with cattle grazing dormant pasture. Over 2" in height.

Score 5

Hard and dry indication of undigested forage. In excess of over 4" in height.





#### Score 2



Score 3



Score 4



### **GRASS QUALITY**

### Lush Green Grass

- Typical Manure Score: 2 •
- Protein is high •
- Energy is low •
- Moisture is elevated
- 20% or 26% cube, as per chart

### **Mature Green Grass**

- Typical Manure Score: 3 •
- Protein sufficient
- Energy sufficient •
- 26% or 32% cube, as per chart

### **Dormant Brown Grass - Fall**

- Typical Manure Score: 4 •
- Protein sufficient
- Energy sufficient
- 32% or 40% cube, as per chart

### **Dormant Brown Grass - Winter**

- Typical Manure Score: 4 or 5 •
- Protein low
- Energy low
- 32% or 40% cube, as per chart

LYSSY & ECKEL FFFDS

### Cows

H	eifers	:
	CIICIS	,

ore dy nd	20 Ci	20% Cube		26% Cube		32% Cube		40% Cube	
Sco	Bo Co Co	Wct	Dry	Wet	Dry	Wct	Dry	Wet	Dry
2	2	1	1	1	1	0.5	0.5	0.5	0.5
2	3	1	0.5	1	0.5	0.5	0	0.5	0
2	4	.5	0	0.5	0	0	0	0	0
2	5	0	0	0	0	0	0	0	0
2	6	0	0	0	0	0	0	0	0
3	2	2	1	1.5	1	1.5	0.5	1	0.5
3	3	1.5	1	1	1	1	0.5	1	0.5
3	4	1	0	1	0	0.5	0	0.5	0
3	5	0	0	0	0	0	0	0	0
3	6	0	0	0	0	0	0	0	0
4	2	7.5	2	6	2	4.5	1	4	1
4	3	7	2	5.5	2	4.5	1	3.5	1
4	4	6.5	1	5	1	4	1	3.5	0.5
4	5	6	1	4.5	1	4	1	3	0.5
4	6	5.5	0	4	0	3.5	0	3	0
5	2	9.5	5.5	7.5	4	6	3.5	5	3
5	3	9	5	7	4	5.5	3	4.5	2.5
5	4	8.5	4.5	6.5	3.5	5	3	4.5	2.5
5	5	8	4	6	3	5	2.5	4	2
5	6	7.5	3.5	6	2.5	4.5	2	3.5	2

ore ore dy nd	20% Cube		26 Cu	26% Cube		32% Cube		40% Cube	
Mar Sci	C Bo	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry
2	2	1	1	1	1	0.5	0.5	0.5	0.5
2	3	1	0.5	1	0.5	0.5	0	0.5	0
2	4	0.5	0	0.5	0	0	0	0	0
2	5	0	0	0	0	0	0	0	0
2	6	0	0	0	0	0	0	0	0
3	2	3	1	2.5	1	2	0.5	1.5	0.5
3	3	2	1	1.5	1	1	0.5	1	0.5
3	4	1.5	0	1	0	0.5	0	0.5	0
3	5	1	0	0.5	0	0	0	0	0
3	6	0	0	0	0	0	0	0	0
4	2	7.5	3	6	2.5	4.5	2	4	1.5
4	3	7	2.5	5.5	2	4.5	1.5	3.5	1.5
4	4	6.5	2	5	1.5	4	1	3.5	1
4	5	6	2	4.5	1.5	4	1	3	1
4	6	5.5	1	4	1	3.5	0.5	3	0.5
5	2	9.5	6	7.5	4.5	6	4	5	3
5	3	9	5.5	7	4.5	5.5	3.5	4.5	3
5	4	8.5	5	6.5	4	5	3	4.5	2.5
5	5	8	4.5	6	3.5	5	3	4	2.5
5	6	7.5	4	6	3	4.5	2.5	3.5	2

# MAKE EVERY BITE COUNT!

### HOW TO USE CHART

- 1. Determine Manure Score.
- 2. Determine Body Condition.
- 3. Choose between cow or heifer and if dry or lactating.
- 4. Determine which cube matches

your current needs.









# Feed source directly impacts, reproductive success.



### **Pre Breeding = Energy + Protein**

Condition, Condition, Condition

### **First Trimester**

• Calf's brain, liver, heart and reproductive organs begin to form.

### Second Trimester

- Continued growth of grow organs, establishing internal systems that will impact how those organs function throughout life.
- Stressed cows and heifers will develop a reduced muscle calf.

### **Third Trimester**

- Be careful not to overfeed, about .5-1% of body weight.
- <u>Often considered the most important</u>, final stages of lung development which sets the calf up for future respiratory health and disease resistance. Stress and nutrition have a vital role in the quality and quantity of colostrum.

#### Maintenance

- Must contain a trace mineral package.
- Calf growth and cow health.



# Trace Mineral Sources, are you remineralizing or excreting?

### **SULFATES**

- 1. Tied with oxides.
- 2. Ionic Bond holds a Sulfate trace mineral together.
- 3. Ionic bonds are broken when in contact with moisture.
- 4. Can be bound by antagonists.
- 5. Free Copper is detrimental to rumen bacteria.

#### **OXIDES**

- **1.** Tied with sulfates.
- 2. Lowest percentage of mineral uptake.
- **3.** Commonly found in minerals, mineral blocks and other feed rations.
- 4. Have VERY little impact on pregnancy.
- 5. Rust.



### HYDROXYCHLORIDES

- 1. Cannot be bound by antagonists
- 2. Iron, Sulfates, Molybdenum, etc.
- **3.** Increase Volatile Fatty Acid Production by 22 - 40%
- 4. Bypasses the rumen, reticulum and omasum
- 5. Protective structure is broken down in abomasum and absorbed in the small intestine like a chelated trace mineral.

#### Overall body impact:

- Semen Quality (Motility and Concentration)
- Egg Quality (Decreased in Degeneration)
- Fiber Digestion
- A.I. Success Rate



### AMINO ACID COMPLEXES

- 1. One amino acid bound to one metal ion.
- 2. Bypasses the rumen, reticulum and omasum
- 3. Protective structure is broken down in abomasum and are absorbed in the small intestine as an amino acid trace mineral.

#### Overall body impact:

- Cellular remineralization
- Mitochodria fuel
- Reproductive success
- Make it into fetus and milk



# Invest in feeds that will pay you back!

### **Trace Mineral Salt Block**

- An industry standard.
- Made with oxide trace minerals.
- Low bioavailability.

Copper	Zinc	Manganese	Iron
Oxide	Oxide	Oxide	Oxide
<b>0-15%</b>	37 <b>-108%</b>	<b>25-103%</b>	<b>O-15%</b>
bioavailable	bioavailable	bioavailable	bioavailable

YOU PAY 100% of what it costs to manufacture this block, yet your cattle only absorb MAYBE 5% of the trace mineral source.





### **SULFATES**

- Ionic bond
- Separates at presence of moisture
  - Manufacturing
  - Storage
  - Weather
  - Saliva

### **OXIDES**

- Covalent bond
- Cannot breakdown bond for absorption.
- Ends up back on ground.



## **Copper Source and Vitamin Stability**





Lu et al., 2010, Biol. Trace Elem. Res. 138:181-189.

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# Amino Acid Complexes,

a.k.a. Organic Chelated Trace Minerals

- 1. Highest efficiency trace minerals available on the market.
- 1. Bypasses the rumen and are absorbed in the small intestine as that trace mineral.

### IMPACTS TO THE WHOLE BODY

- Fetal Development
- Bone Density
- Muscle Development
- Body Synthesis
- Semen Quality
- Estrus Cycle
- Milk Production
- Mitochondrial Function



# **Bioavailability**,

the quantity or percent of the trace mineral absorbed by livestock.

	Sulfate	Oxide	Carbonate	Chloride	Amino Acid Complexes
Zinc	100	37 - 108	58 - 100	42 - 99	150 - 206
Manganese	100	25 -103	23 - 98	93 - 102	148 - 174
Copper	100	0 - 15	66 - 68	100 - 110	116 - 120
Iron	100	0 - 15	0 - 75	44 - 78	183

Sulfate is always assigned a value of 100 and values for other sources are determined using regression equations, the 100 value is relative and does not indicate 100% absorption.

Adapted from: Ammerman, C.B., D.H. Baker, and A.J. Lewis. 1995.

# Amino Acid Complexes, absorption pathways.

- 10+ Mitochondria in each cell
  - excluding red blood cells
- 10,000+ Mitochondria in each cell of the
  - Heart
  - Frontal Cortex
  - Ovaries
- 100,000+ Mitochondria in each oocyte.



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# What is the most expensive feed?

### 20% Range Cube

- Low protein
- Give me more!
- You pay for % of protein in cattle cubes.



### Example

- \$558/37 = \$15.09
- \$15.09 x 20 = \$301.80
- 20% cubes would need to be \$301.80/ton to be more cost effective than a 37% cube.

### NM STUBBLE BUSTER BREEDER 20%

#### FOR BEEF CATTLE ON PASTURE

#### GUARANTEED ANALYSIS

Crude Protein, not less than 20.00%
Crude Fat, not less than 3.00%
Crude Fiber, not more than 12.00%
Calcium, not less than 1.40%
Calcium, not more than 1.80%
Phosphorus, not less than
Salt, not less than
Salt, not more than
Potassium, not less than 1.00%
Vitamin A, not less than 20,000 I.U./lb
Thiamine, not less than

INGREDIENTS: Processed grain by-products, plant protein products, forage products, cane molasses, calcium carbonate, dicalcium phosphate, monocalcium phosphate, magnesium oxide, salt, vitamin A supplement, vitamin D3 supplement, vitamin E supplement, thiamine mononitrate, zinc hydroxychloride, zinc amino acid complex, manganese hydroxychloride, manganese amino acid complex, basic copper chloride, copper amino acid complex, ethylenediamine dihydriodide, cobalt glucoheptonate, selenium yeast, and sodium selenite.

FEEDING DIRECTIONS: Feed **NM STUBBLE BUSTER BREEDER 20%** to cattle at the rate of 2 to 7 pounds per head per day. Adequate roughage and water should be maintained at all times.

Manufactured by LYSSY & ECKEL, INC. ROSWELL, NM 88203



Net Wt. 50 lbs. (22.6 kg.)

% cube BAGGED	Lbs. protein/ton	<b>\$ / ton</b>	\$ / lb. protein	# / head per feeding	head / ton fed
20%	400#	\$440.00	\$1.10	5#	400 hd.
28%	560#	\$498.00	\$.89	4#	500 hd.
32%	640#	\$534.00	\$.84	3#	667 hd.
37%	800#	\$558.00	\$.70	2.5#	800 hd.

% cube BAGGED	\$/ton	Lbs. / head per feeding	Lbs. of protein/ head per feeding	\$ / head per feeding
20%	\$440.00	5#	1.00#	\$1.10
28%	\$498.00	4#	1.12#	\$1.00
32%	\$534.00	3#	.96#	\$.81
37%	\$558.00	2.5#	1.00#	\$.70

% cube BULK	# protein/ton	\$ / ton	\$ / # protein	#/ head per feeding	head / ton fed
20%	400#	\$392.00	\$.98	5#	400 hd.
28%	560#	\$448.00	\$.80	4#	500 hd.
32%	640#	\$484.00	\$.76	3#	667 hd.
37%	800#	\$512.00	\$.64	2.5#	800 hd.

% cube BULK	<b>\$ / ton</b>	\$ / # protein	# / head per feeding	Lbs. of protein/ head per feeding	\$ / head per feeding
20%	\$392.00	\$.98	5#	1.00#	\$1.00
28%	\$448.00	\$.80	4#	1.12#	\$.92
32%	\$484.00	\$.76	3#	.96#	\$.75
37%	\$512.00	\$.64	2.5#	1.00#	\$.65

# Forage Sampling Program.

Do you know what's in your forage?

Are you adequately remineralizing your herd?

- Take the guesswork out of your herd's nutritional needs.
- Reliable testing by DairyOne Laboratories at Cornell University.
- One-on-one mineral analysis with our team.
- Custom feed planning.
- Improvements to your herd's performance, fertility, health and forage digestion.





Let's test your forage!

- 1. Stop by our booth.
- 2. Meet our team and leave us your contact information.
- 3. Grab a kit, you will have everything you need, including directions.
- 4. Take the kit with you when you're out feeding and collect your samples.
- Drop your samples in the mail to our partners at DairyOne.
- 6. Lyssy & Eckel will contact you to go over results and

help you create a custom feeding plan!

### You can't monitor what you don't measure!



# **Beef Cattle Requirements.**

Mineral or Vitamin	Unit	Growing Finishing	Gestation	Early Lactation	Maximum Tolerable Level
Magnesium	%	0.10	0.12	0.20	0.40
Potassium	%	0.60	0.60	0.70	3.00
Sodium	%	0.06-0.08	0.06-0.08	0.10	
Sulfur	%	0.15	0.15	0.15	0.40
Cobalt	ppm	0.10	.10	0.10	10.00
Copper	ppm	10.00	10.00	10.00	100.00
Iodine	ppm	0.50	0.50	0.50	50.00
Iron	ppm	50.00	50.00	50.00	1000.00
Manganese	ppm	20.00	40.00	40.00	1000.00
Selenium	ppm	0.10	0.10	0.10	2.00
Zinc	ppm	30.00	30.00	30.00	500.00
Vitamin A	IU/lb	1000.00	1300.00	1800.00	
Vitamin D	IU/lb	125.00	125.00	125.00	

LYSSY & ECKEL F E F D S

Adapted from: Oklahoma State University.

Forage Analysis for 1200 # Lactating Cows - April 2024 Samples										
	Pasture 1	Pasture 2	Pasture 3	Pasture 4	Pasture 5	Pasture 6	Pasture 7	AVG of Nutrients	Maximum Tolerable	
			- dottare o	- dottare -	- dotaic o			Provided by Grass	Level	
Protein (%)	23.4	26.4	25.2	20.5	19.8	18.7	16.5	21.50		
Calcium (%)	0.44	0.43	0.41	0.34	0.32	0.35	0.40	0.38		
Phosphorus (%)	0.33	0.35	0.33	0.31	0.29	0.26	0.30	0.31		
Magnesium (%)	0.13	0.17	0.14	0.12	0.12	0.12	0.10	0.13	0.40%	
Potassium (%)	2.50	2.56	2.65	1.86	1.74	1.59	1.37	2.04	3%	
Sulfur (%)	0.22	0.36	0.30	0.48	0.53	0.55	0.51	0.42	0.40%	
Iron (ppm)	327	293.00	216	378	455	626	510	400.71	500 ppm	
Zinc (ppm)	25	33	29	22	23	28	28	26.86	500 ppm	
Manganese (ppm)	70	75	39	50	61	48	53	56.57	1000 ppm	
Copper (ppm)	7	9	8	8	9	9	10	8.57	40 ppm	
Molybdenum (ppm)	2.9	1.4	1.5	2.1	2	2.4	2.8			
CU:MO Ratio	2.41:1	6.43:1	5.33:1	3.81:1	4.5:1	3.75:1	3.51:1			
Sodium (%)	0.031	0.018	0.014	0.009	0.016	0.018	0.014	0.017		
NEm (Mcal/lb)	0.64	0.64	0.72	0.65	0.61	0.62	0.67	0.650		

#### \* Samples that show exceedingly high levels of iron and sulfur

According to Oklahoma State University research, cattle can tolerate up to 500 ppm iron and up to .40% sulfur in their diet. Sulfur and iron are known antagonist in bovine nutrition that reduce bioavailability of other essential trace minerals by forming a tightly bound complex that can't be absorbed in the abomasum. To help combat this, Lyssy & Eckel fortifies our range cubes and mineral with Intellibond hydroxy trace minerals which utilize a strong covalent bond, a unique crystalline structure and low solubility in the rumen to limit antagonism and nourish the animal.

1200# lactating cow eating 2.5% of BW in DM								
	Nutrient requirements	Nutrients Provided by Grass (g)	Nutrients Provided by NM Summer Range 16:8 (fed in oz)	Nutrients Provided by Grass & NMSummer Range 16:8 (g)				
			4					
Crude Protein (g)	1362.00	2928.30	0.46	2928.76				
Calcium (g)	40.86	52.34	18.13	70.47				
Phosphorus (g)	27.24	42.22	9.55	51.77				
Magnesium (g)	27.24	17.51	26.08	43.59				
Potassium (g)	95.34	277.65	1.47	279.13				
Sulfur (g)	20.43	57.40	0.56	57.96				
Iron (g)	0.68	5.46	0.01	5.47				
Zinc (g)	0.41	0.37	0.56	0.93				
Manganese (g)	0.54	0.77	0.37	1.14				
Copper (g)	0.14	0.12	0.26	0.38				
Sodium (g)	13.62	2.33	6.51	8.84				

Discovered Antagonists						
Inco	Maximum tolerable level of iron is 500 ppm Excess iron in the diet is antagonistic to zinc and copper.					
IIOII						
0.16.	Maximum tolerable level of sulfur is .40%					
Sullur	Excess sulfur is antagonistic to zinc, copper and selenium.					
Molybdenum A copper to molybdenum ratio less than 4:1 may create						



1200# lactating cow eating 2.5% of BW in DM								
	Nutrient requirements	Nutrients Provided by Grass (g)	Nutrients Provided by NM Stubble Buster 20 (fed in Ibs)	Nutrients Provided by Grass & Cube (g)	Nutrients Provided by NM Summer Range 16:8 (fed in oz)	Nutrients Provided by Grass & Cubes & NM Summer Range 16:8 (g)		
			2.25		4			
Crude Protein (g)	1362.00	2928.30	205.34	3133.64	0.46	3134.11		
Calcium (g)	40.86	52.34	17.65	69.99	18.13	88.12		
Phosphorus (g)	27.24	42.22	8.47	50.69	9.55	60.24		
Magnesium (g)	27.24	17.51	3.57	21.08	26.08	47.17		
Potassium (g)	95.34	277.65	10.40	288.06	1.47	289.53		
Sulfur (g)	20.43	57.40	2.03	59.43	0.56	59.99		
Iron (g)	0.68	5.46	6.12	11.58	0.01	11.59		
Zinc (g)	0.41	0.37	0.10	0.47	0.56	1.03		
Manganese (g)	0.54	0.77	0.10	0.87	0.37	1.25		
Copper (g)	0.14	0.12	0.02	0.14	0.26	0.40		
Sodium (g)	13.62	2.33	4.08	6.41	6.51	12.92		

\*Deficiencies



### Dairy One - Feed Composition Library

Forage Laboratory

Main Library State Seasonal Library

O Forages Fresh	Group	ltem	Samples 🝸	Average <b>T</b>	Range (low) 🝸	Range (high) 🝸	Standard Deviation <b>Y</b>
O Forages, Hav	•	% uNDFom 240hr (NIR)	0	0	0	0	0
○ Forages, Silage	•	NDFDom 240hr, % of NDF (WC)	5	93.566	93.566	93.566	0
○ Grains/ByProducts, Dry	•	NDFDom 240hr, % of NDF (NIR)	0	0	0	0	0
O Grains/ByProducts, High Moisture/Wet		% Calcium	7,271	0.086	0	0.284	0.198
Protein Feeds, Dry		% Phosphorus	7,388	0.898	0.718	1.079	0.18
O Protein Feeds, High Moisture/Wet		% Magnesium	7,139	0.329	0.247	0.41	0.081
O Manure		% Potassium	7,142	1.103	0.81	1.396	0.293
○ Water		% Sodium	4,558	0.214	0.013	0.415	0.201
Kind		PPM Iron	4,414	115.491	7.138	223.843	108.353
641 - DISTILLERS GRAINS		PPM Zinc	4,445	<u>6</u> 5.04	17.741	112.339	47.299
Crop Season		PPM Copper	4,441	7.088	<mark>o</mark>	<mark>23.459</mark>	16.371
Accumulated Years: 5/1/2004 - 4/30/2023 ¥		PPM Manganese	4,443	28.724	0	82.59	53.866
Groups to Display:		PPM Molybdenum	4,350	1.208	0.618	<mark>1.798</mark>	0.59
Ash and Minerals		PPM Cobalt	78	0.341	0	1.861	1.521
🖌 Fat		PPM Selenium	24	0.594	0.185	1.003	0.409
Fermentation Profile		<mark>% Sulfur</mark>	6,326	0.66	0.206	<mark>1.114</mark>	0.454
Miscellaneous		% Chloride	1,233	0.269	0.008	0.53	0.261
		% Nitrates	18	0.001	0	0.007	0.006

### DISCOVERING ANTAGONISTS

 Iron
 Maximum tolerable level of iron is 500 ppm. Excess iron in diet is antagonistic to copper and zinc.

 Sulfur
 Maximum tolerable level of sulfur is .40% Excess sulfur is antagonistic to zinc, copper, selenium and creates a thiamine deficiency.

 Molybdenum
 A copper to molybdenum ratio less than 4:1 will tie up copper in diet and could create molybdenum toxicity.





