2014

How Environmental Conditions Affect Cattle Diets

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Recommended Citation

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How Environmental Conditions Affect Cattle Diets

THE EXPERIMENT

How does temperature affect the quality?
- Warming during fall and spring-greater time of quality forage for C3 plants
- Increases in temperature favor C4 grasses-lower quality of forage
  (Crane et al.)

- This means that if the plant does not have the adequate amount of nitrogen it will show signs of stress and will not grow to its full potential thus, decreasing the quality
- In native grasses, its different, plant nitrogen is lower with more precipitation
- C3 plants like more precipitation and a little more nitrogen
  (Crane et al.)

What is a C3 plant?
- A plant that fixes Carbon in to a 3-Carbon compound
- Does not perform well under low CO2 conditions
- Usually had slow and inefficient Carbon Dioxide fixation
- The cycle in a C3 plant happens in all plants (Major Differences)

What is a C4 plant?
- A plant that fixes Carbon in to a 4-Carbon compound
- Can perform under low CO2 conditions
- Carbon Dioxide fixation is more efficient and faster
  The C4 Cycle ONLY happens in C4 plants (Kimball)

How does a C4 plant work?
- CO2 enters the plant into the mesophyll cell
- It forms a C4 compound (PEP)
- Which form a four carbon compound (oxaloacetic acid) which turns in to malate
  At this stage it enters the bundle sheath cells and goes through the calvin cycle
- If it doesn't go through the calvin cycle it becomes to pyruvic acid (C3) and is taken back to the mesophyll cells and turned back in to (PEP) and goes through the cycle again (Kimball)

What did they find out about crude protein (CP)?
- Protein concentrations decreased when temperature increased
- Protein concentration were usually lower in warmer regions
- Decrease in precipitation increased temperature, which ultimately decreased protein
- GP in warmer places would be sensitive to precipitation changes than CP in colder places
  (Crane et al.)

What did they find out about digestive organic matter (DOM)?
- The effect that climate had on CP was similar to the effect of DOM
- DOM increased and average precipitation increased
- Scientists decided that there was a difference between C3 and C4 plants but not enough to worry about it
  (Crane et al.)

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