

# Understanding Biobased Content



# Understanding Biobased Content

- What is biobased content?
  - Biobased content is how much “new” or recent organic carbon is in an object or substance, compared to the amount of “old” organic carbon it contains.



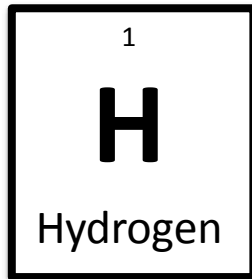
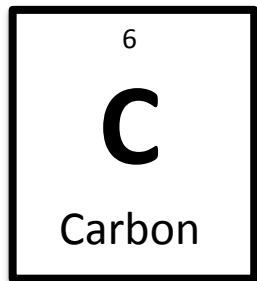
A tree is 100% Biobased



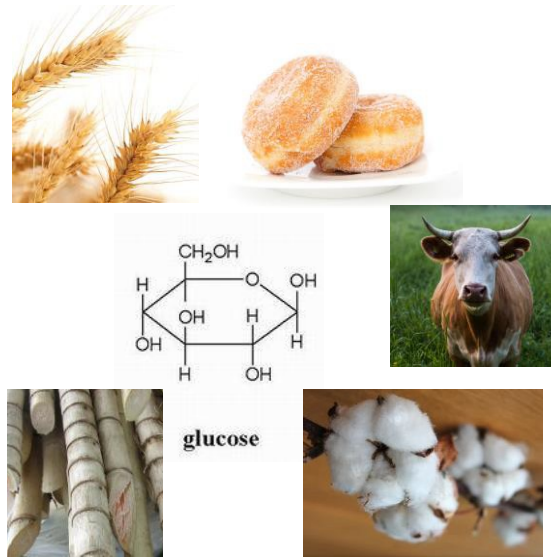
Coal is 0% Biobased

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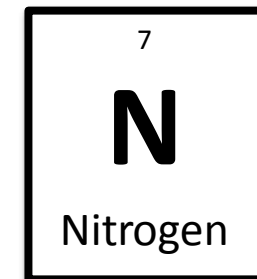
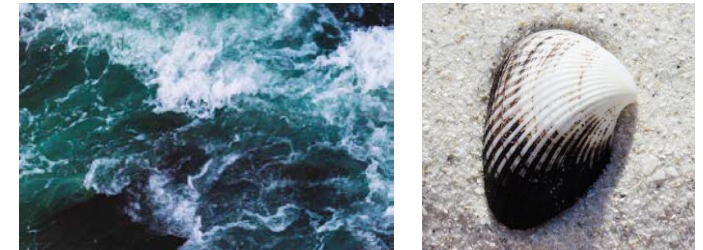
- Biobased content is calculated using **only** organic carbon. What is organic carbon?



Organic carbon has C-H bonds  
(and often C-C bonds)



Glucose (sugar) contains organic carbon  
(and can be broken down to make many  
other organic molecules.)

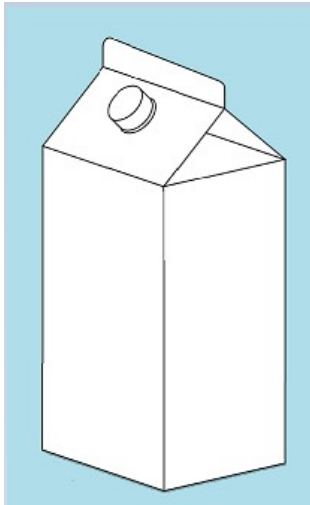


Water, carbonate, and other inorganic or  
non-carbon molecules are **not** considered  
when calculating biobased content.

\*An organic molecule is *not* the same as an “organic” food you would buy at the store

# Understanding Biobased Content

- What about man-made objects?



Some milk cartons are 90% biobased (biobased paper coated with a petroleum-based plastic coating)



Styrofoam is typically 0% biobased (it is made from polystyrene, a petroleum derivative)



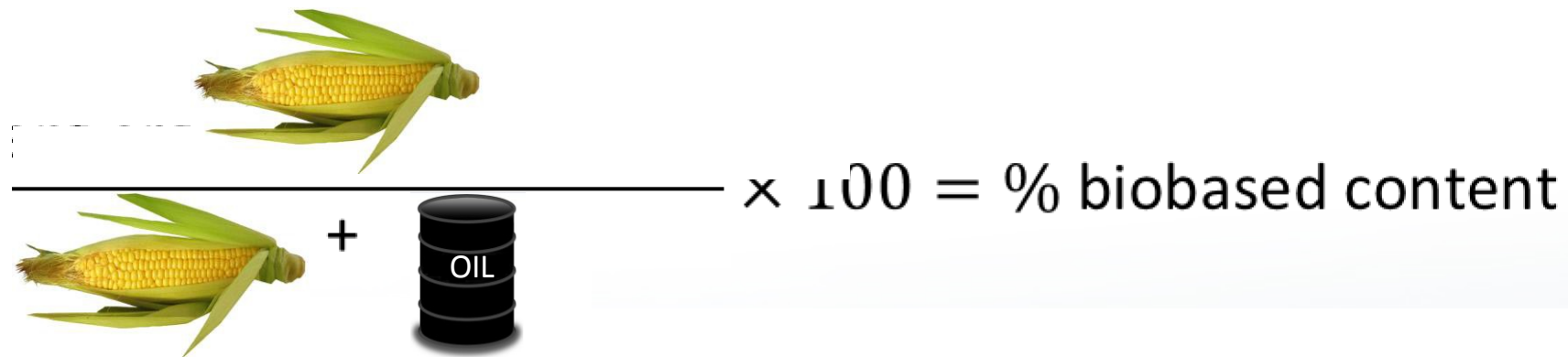
The organic carbon in some paint comes from 80% plant oil and 20% petroleum derived materials. This makes the paint 80% biobased.

# Calculation of Biobased Content

This equation can be used to calculate biobased content:

$$\frac{\text{"new" organic carbon}}{\text{"new" organic carbon} + \text{"old" carbon}} \times 100 = \% \text{ biobased content}$$

For example:


$$\frac{\text{Corn}}{\text{Corn} + \text{Oil}} \times 100 = \% \text{ biobased content}$$

# Calculation of Biobased Content

- Summary:
  - Biobased content is calculated using the ratio of “**new**” **organic carbon** (plant or agricultural-based) to **total organic carbon** (“new” organic carbon + “old” or fossil fuel-based organic carbon).
  - The test method ASTM D6866 is used to quantify this value.
  - Inorganic carbon and water are excluded.

If you still have questions about how to calculate biobased content, please contact USDA BioPreferred Program staff ([help@usdabiopreferred.net](mailto:help@usdabiopreferred.net))