

## Methane Production:

- In the United States cattle emit about 5.5 million metric tons of methane per year into the atmosphere.
  - Accounts for 20% of methane emissions from human sources.
- Globally cattle produce about 80 million metric tons of methane annually.
  - Accounts for 28% of global methane emissions from human sources.

## Chemistry of Rumination

- Cows release methane due to a process called enteric fermentation that takes place in the rumen (located in the first stomach) as they digest with a small percentage created in the large intestine.
- All ruminants (herbivores) chew their food twice due to their high cellulose diet and their lack of the special enzyme that breaks down cellulose. Instead they rely on the bacteria that can be found in their stomach.
- This bacteria uses non-protein nitrogen in order to create short chain fatty acids or proteins.
- The cow regurgitates and chews its food further in order to further help the break down of cellulose and during this gases from the digestive process of this are released, the prominent one being methane.
- Methane is 20 times more powerful than carbon dioxide so this is a problem the public should be concerned with.

## Mini cows fight global warming?

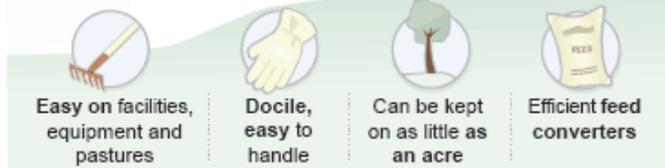
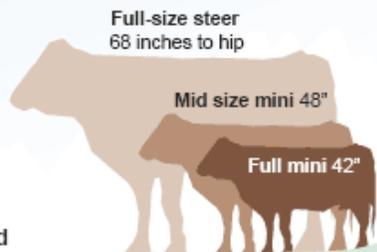
	Normal Cow	Mini Cow
<b>Acreage</b>	5 acres	0.5 acres
<b>Methane Produced</b>	280 liters	28 liters
<b>Required Feed</b>	3 units	1 unit
<b>Beef Produced</b>	1 unit	3 units

- A farmer could raise ten miniature cows on five acres of land as opposed to two.
- There are now about 20,000 miniature cows (100 million normal cows) in the U.S., which produce the methane of 2,000 full size cows.
- It takes ten mini-cows to produce the same amount of methane as one full-sized cow.

## Small herd easier for small farms

Breeders are raising miniature cattle that are ideal for small farms. There are currently 26 breeds, sold for small-scale milk production, breeding and as pets.

A human-friendly breed



SOURCE: International Miniature Cattle Breeders Society and Registry

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## Other solutions to gassy cows

- The production of methane from cows represents a loss of carbon from the rumen and is an unproductive use of dietary energy.
- Scientists have been looking for ways to suppress methane production with the most promising approach being an increase in productivity and efficiency of livestock production.

- This includes better grazing management as well as dietary supplements.