

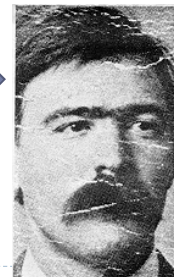


## The Lifecycle of a Hamburger and its environmental implications

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### Brief history of the hamburger

- ▶ “Hamburg steak” imported by German sailors
- ▶ Many claims about who made the first hamburger and bun in the US
- ▶ 1891 - Oscar Weber Bilby serves first-known hamburger on a bun in his farm, west of Tulsa, Oklahoma
- ▶ 1904 - World's Fair in St. Louis, Missouri, hamburger served by Fletcher Davis is reported in *New York Tribune*
- ▶ Today, symbol of the American cuisine around the world



## Hamburger statistics

- ▶ McDonald's worldwide sold its 100 billionth hamburger in 1993 (38 years after foundation)
- ▶ Americans eat about 13 billion hamburgers a year.
- ▶ If you put all those burgers in a straight line, they would circle the earth more than 32 times.
- ▶ Americans currently spend about \$134 billion per year on fast food



## Ingredients of the hamburger

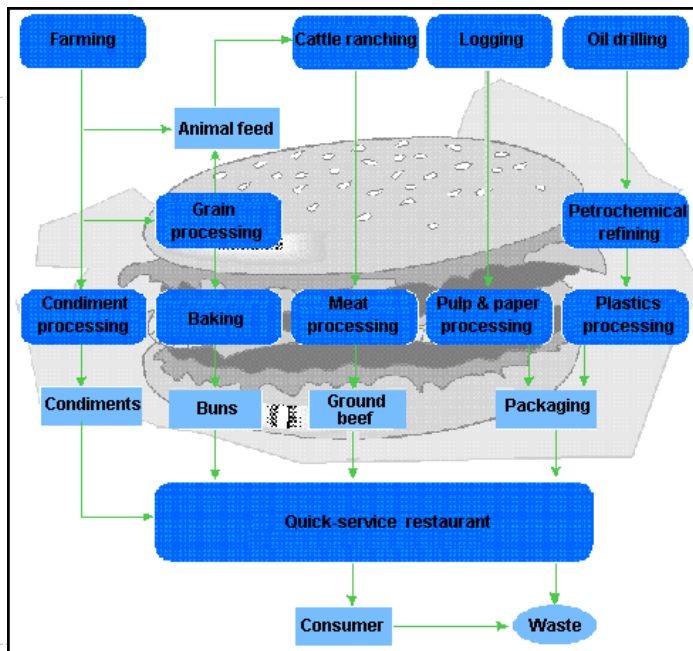
- ▶ From McDonald's website:

100% Beef Patty, Regular Bun, Ketchup, Mustard, Pickle Slices, Onions



## Lifecycle of a hamburger

- ▶ Agricultural phase
- ▶ Processing phase
- ▶ Consumption phase



## Lifecycle inefficiencies and byproducts

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- ▶ **Food loss:**
    - ▶ At each stage of lifecycle
    - ▶ Quality deterioration during storage and transportation
    - ▶ Food clings to equipment
    - ▶ For each kg of frozen-fried onions, 12 kg need to be harvested
    - ▶ Quantity of grain needed for 4 hamburgers could feed someone in a developing country for more than a week
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## Lifecycle inefficiencies and byproducts

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- ▶ **Energy intensive lifecycle – fossil fuel needed for**
    - ▶ Farm equipment, grain transportation to mills and feedlots
    - ▶ Processing cattle into beef
    - ▶ Meat refrigeration and cooking
    - ▶ Bake buns
    - ▶ Transportation at each phase (from fields to restaurants)
  - ▶ **One quarter-pound hamburger requires 10-20 times as much energy as grain**
  - ▶ **More energy goes into the production of the hamburger than is gained by the person who consumes it.**
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## Lifecycle inefficiencies and byproducts

- ▶ Waste generation (manure, packaging, etc.)
- ▶ Degradation of land (intensive agriculture)
- ▶ Water pollution (fertilizers, pesticides, etc.)
- ▶ Deforestation (US and Central America)
  - ▶ 1 quarter-pound of hamburger = 55 square feet of tropical forest



## Environmental implications – Carbon footprint

- ▶ **Biggest share: meat production**
  - ▶ Energy → CO<sub>2</sub>
  - ▶ Cows → methane (35 times more harmful than CO<sub>2</sub>)
  - ▶ Deforestation → CO<sub>2</sub> release
- ▶ Annual CO<sub>2</sub>-equivalent emissions  
 → American hamburger consumption  
 = 6.5 million SUVs



## Hamburger and public health

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- ▶ High-fat, calorie dense, low-fiber
- ▶ Obesity, heart disease, high blood pressure (from overconsumption)
- ▶ Food poisoning (E. coli bacteria found in undercooked hamburgers).



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If the hamburger is so bad, why is it so popular?



## Popular because...

- ▶ Cheap (true costs remain externalities)
- ▶ Convenient (eat it on the go)
- ▶ Fast (get it and eat it within minutes)
- ▶ Accessible (12,804 McDonald's restaurants in the US)
- ▶ Embedded in American culture
- ▶ Lack of information



## Hamburger is bad, so get rid of it?...

- ▶ Hamburger economics:
  - ▶ Hamburger #1 selling item in fast-food restaurants
  - ▶ Americans currently spend about \$134 billion per year on fast-food
  - ▶ Agriculture, transportation, packaging and even advertising affected by hamburger
  - ▶ 90% of new jobs in the US created by the fast-food industry
- ▶ Consumer demand → Hamburger → Fast-food → Economy

## Some improvements of the lifecycle

- ▶ Recycle manure (crop nutrient)
- ▶ McDonald's McGreening: reduce waste by 80%
- ▶ CO<sub>2</sub>-emission labeling of food (Sweden)
  - ▶ Hamburger = 1.7 kg of CO<sub>2</sub> emissions
  - ▶ Chicken sandwich = 0.4 kg of CO<sub>2</sub> emissions
- ▶ McDonald's McVeggie: an alternative to the hamburger
  - ▶ Past failure but maybe potential today



## Real change comes from YOU!

- ▶ Information and consumer education
- ▶ Demand shift from consumers will influence rest of supply chain



## Q & A



## Citations

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