From food insufficiency towards trade dependency:

A historical analysis of global food availability

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Background and motivation

• Understanding of historical changes in global food system would be vital for tackling future food security challenges

• Comprehensive global analyses of past food system dynamics do not exist

• Here we analyse how food availability, food self-sufficiency and food trade have changed globally during 1965-2005
Data and methods

• Analyses based on the calculation of national level dietary energy supply and dietary energy production

• Data extracted from the FAOSTAT Food Balance Sheets and Commodity Balances

• 71 food crop and 24 animal products, 174 countries

• Calculations averaged over five year periods, resulting in nine time steps (1965, 1970, 1975,…, 2005)
Data and methods

• Classification of food availability was based on a country's dietary energy supply in relation to dietary energy requirements.
• Global minimum dietary energy requirement (MDER) and average dietary energy requirement (ADER) were used as a reference.
• Similarly, food self-sufficiency was defined as the ability to produce the required dietary energy domestically.
Data and methods

- Trade analysis was based on national food supply-production balance.
- Thresholds of 500 and 1500 kcal/cap/d correspond to 20 and 60% of global ADER respectively.
- In addition, composition of diets was analysed by looking at the share of animal based calories of a country’s total dietary energy supply.
Food availability

**Food Availability**

**Dietary energy supply [kcal/cap/d]**

- **CRITICALLY LOW**
- **LOW**
- **ADEQUATE**
- **HIGH**

**Billion people**

- **SUFFICIENT SUPPLY**
- **INSUFFICIENT SUPPLY**

**% of population**

- **65**
- **70**
- **75**
- **80**
- **85**
- **90**
- **95**
- **00**
- **05**

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Food self-sufficiency

1965  1975  1985

1995  2005

FOOD SELF-SUFFICIENCY

MDER  ADER

LOW INSUFFICIENT SUFFICIENT HIGH

Dietary energy production [kcal/cap/d]

% of population

Billion people
Food trade

FOOD TRADE

HIGH MODERATE LOW LOW MODERATE HIGH

NET IMPORTS NET EXPORTS

Net food exports [kcal/cap/d]

% of population

Billion people
Diet composition

- In the beginning of the study period, 58% of the world’s population had adequate supply of animal foods
- By 2005, over a half of total population had high supply of animal foods
  - In 1965 only about a third
- In absolute terms, supply of animal based calories has increased 2.6 fold
Summing up

- While food availability improved globally during the study period, food self-sufficiency did not increase significantly.
- In the beginning of the study period insufficient domestic production meant insufficient food supplies but in recent years it has been compensated by increased food imports.
- Trends in food trade indicate that increasingly large population relies heavily on food trade.
- Imports not merely a way to secure food supply but increasingly also a means to maintain a certain lifestyle and diet.
Way forward

• Identify drivers behind these trends
  – Food supply and consumption of animal foods tend to increase when income rises
  – In some regions, resource constraints (land and water) seem to limit domestic food production

• Other possible drivers include urbanisation, changes in agricultural and trade policies etc

• Dynamics still not very well understood
Thank you!

More information?
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