The influence of livestock products (LP) on nutrition during the first 1000 days

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Overview

• Why livestock products (LP) and the first 1000 days?
• LP and nutrition: biology
• LP and nutrition: current importance
• Empirical evidence on LP and livestock interventions
• LP risk: foodborne disease
• LP constraints: environmental impacts
• Study conclusions
• Reflections for future research & policy agenda
Why livestock products and the first 1,000 days?

• Stunting - a grave and persistent problem
• First 1,000 days key to growth & cognitive development
• Many attempts to address systemically
  • Nutrition specific
  • Nutrition sensitive

• Livestock products (LP)
  • High potential
  • High risk
LP and nutrition: biology

**LP nutritional benefits**
- Preferred, palatable
- Nutritionally dense
- Nutritionally rich: high biological value protein, vitamins, minerals

**LP nutritional risks**
- Associated with excessive calorie and excessive animal fat consumption
- Associated with non communicable disease
The double burden: hunger & obesity

- 2.1 billion people are overweight or obese
- Two thirds of obese people live in poor countries
- No country has had significant decreases in obesity in the last 33 years
Interactions are complex
Overview

• LP and nutrition in the first 1000 days: biology
• LP and nutrition: current role
• Empirical evidence on LP
• LP risk: Foodborne disease
• LP constraints: Environmental impacts
• Conclusions
LP a minor part of developing country diets

Europeans eats five times as much LP as Africans
But LP an important source of protein in developing country diets.
And LP the major source of high quality protein
Livestock trending up, fish slower, pulses down

- Protein (grams per capita per day)
- Livestock
- Aquatic
- Pulses
Drivers of LP consumption trending up

Not extremely poor (%)

Retail price for meat in China vs GDP

Retail price for meat in China vs GDP

GDP
Infants 0-6 months: too much LP!
Recommended level = 0

Infants (%) fed LP in last 24 hours

Dairy | Meat, fish, poultry | Eggs | Dairy | Meat, fish, poultry | Eggs | Dairy | Meat, fish, poultry | Eggs
---|---------------------|-----|-------|---------------------|-----|-------|---------------------|-----
Sub-Saharan Africa | South Asia | South East Asia
DHS surveys
Infants 6-18 months: not enough LP!
Recommended level = 100%

Infants (%) fed LP in last 24 hours

DHS surveys
Overview

• LP and nutrition in the first 1000 days: biology
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• Conclusions
**Research question:** Do interventions that increase consumption of livestock-derived foods (meat and derived products, milk and dairy products and eggs) during the first 1000 days (children 0-2 years or pregnant and lactating women) improve nutrition outcomes in LMIC

- **Eligibility criteria for literature search**
  - Interventions during the first 1,000 days with LP supplementation and a control group
  - South and Southeast Asian and African countries
  - Non fortified, non-mixed LP interventions
1679 records identified through database after removal of duplicates

68 abstracts identified for consideration

47 Full text articles obtained to assess eligibility

Ongoing process
**Research question:** Do livestock interventions improve nutrition in the first 1,000 days?

- Eligibility criteria for literature search
  - Type of articles: reviews (systematic, scoping, narrative,....), including interventions with nutrition outcomes during the first 1,000 days
  - In South and Southeast Asian and African countries since 2005

- Search in PubMed and CabDirect library databases.
  - 268 titles/abstracts identified in the search
  - Double blind screening of titles/abstracts finalised (2 reviewers): 15 documents for assessment
Initial results

- Lack of experimental evidence (trials) on the nutritional impact of LP consumption in LMIC, and particularly during the first 1,000 days.
- Some specific studies are being conducted at present e.g. a multicentre study on meat consumption that might provide interesting results from toddlers.
- The impact on nutrition of agriculture (livestock) interventions and the relevant impact pathways are still poorly understood, mostly due to the lack of evidence from specifically, well-designed projects.
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Causes of foodborne disease

Burden in developing countries in DALYs per year

- **Microbes**: Approximately 25,000,000
- **Helminths**: Approximately 5,000,000
- **Aflatoxins**: Approximately 1,000,000
- **Other toxins**: Approximately 1,000,000

Havelaar et al., 2015
Foodborne disease and the first 1,000 days

Havelaar et al., 2015

Bacteria
Parasite
Virus
Aflatoxin
Protozoa
Chemical

Health burden (DALYS million per year)

Older (>5 yrs)
Infants (<5 years)
LP most often implicated in FBD

Foods causing illnesses

- China
- USA
- Vietnam
- India
- Netherlands
- UK

- Animal source food
- Produce
- Other
Diarrhoea a risk factor for stunting – perhaps 10-20%?
Ingestion of faecal material on food or in the environment may contribute to environmental enteropathy leading to stunting
Associations between aflatoxins and stunting
Regulations aimed to improve food safety may decrease the availability and accessibility of foods for infants
Food scares decrease consumption for all
Overview

- LP and nutrition in the first 1000 days: biology
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- LP constraints: Environmental impacts
- Conclusions
Meat higher environmental cost than pulses; chicken lower or comparable.

*Soybean data: soybean emission intensity range for various production conditions in Latin America; Chatham House analysis based on data from Castanheira and Freire (2013); raw soybean protein content data from USDA National Nutrient Database for Standard Reference Release 28. Sources: Adapted from FAO (2013) and Castanheira and Freire (2013).
Comprehensive sustainability

- Difficulty
- Job loss
- More GHG
- Worse animal welfare
- Pandemics
- NCD

- More intensive
- Beef free
- No LP
Meeting infants needs for protein is compatible with large reductions in LP.

If infants (6-24 months) got all their protein needs from meat they would need just 0.6% of the world’s meat production each year; if from milk they would need 3% of the world’s production.
‘Goldilocks solution’
Conclusions

• LP have an important role in nutrition but are under-evidenced – “livestock chill”

• Drivers of LP consumption more powerful than drivers of LP restriction

• Infants are eating too much and too little LP

• FBD has a health burden equivalent to malaria, HIV/AIDS or TB: infants are worst affected

• FBD harms nutrition through direct (disease) and indirect (disease control) pathways

• Meat has a higher environmental cost than pulses; poultry is lower or comparable

• Sustainability depends on product and scope

• When making policy for diets, first 1000 days should be privileged
Future research and policy agenda

- Livestock inherently complex and contradictory – assessment and interventions require sophisticated multi-sectoral approaches that are rarely available.
- People reliably consume more LP when available and affordable: reducing and shifting consumption more challenging.
- Nutrition-specific, and agriculture for nutrition interventions have successes but limitations. Focus shifting to livestock value chains and market-driven approaches.
- Women manage 1,000 day consumption but gender has yet to be harnessed as a transformative force.
- Overcoming externalities and negative perceptions can unleash the nutritional power of livestock products.
- Many studies but little evidence: need to invest in high quality research to answer important questions.
  - Ask the audience?
better lives through livestock

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