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Alternative national development scenarios and their implications for the livestock system in Ethiopia

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June 24, 2020
Virtual Seminar

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THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
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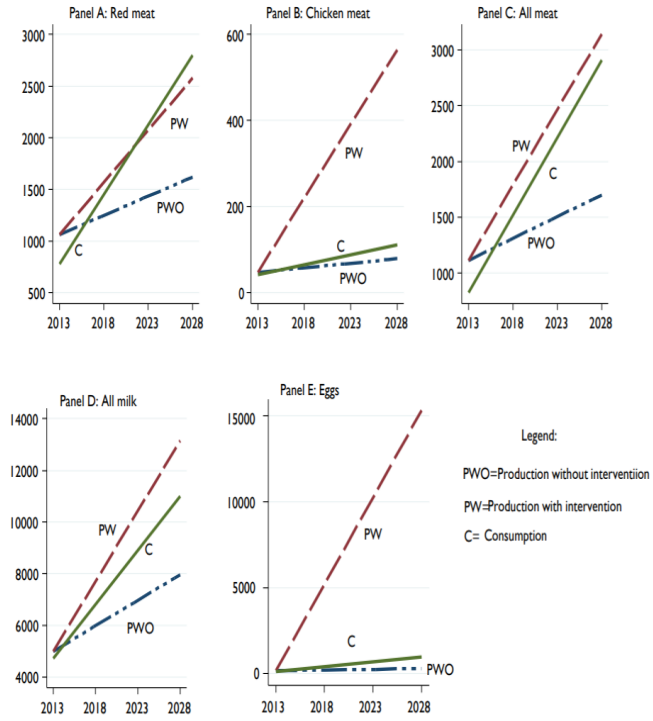
PROBLEM

- IFPRI research shows that demand for ASF has grown rapidly.
- Income growth and urbanization is driving this change.
- The LMP lays out an ambitious and sizable investment plan based on very high projected demand growth for 2015-2020 period
  - But income growth slowed down considerably (from 10% to IMFs latest forecast of 6.5%)
  - COVID and other risks could push this down even further over the next five years
  - This means the LMP is no longer appropriate for the new economic trajectory.

Figure 1: Production and consumption requirement projections from 2013 to 2028, with and without investment interventions.



Source: Based on LSA results.

- >35% annual increase in meat consumption
- >10% annual increase in meat production
- >10% annual increase in milk consumption
- >12% annual increase in milk production

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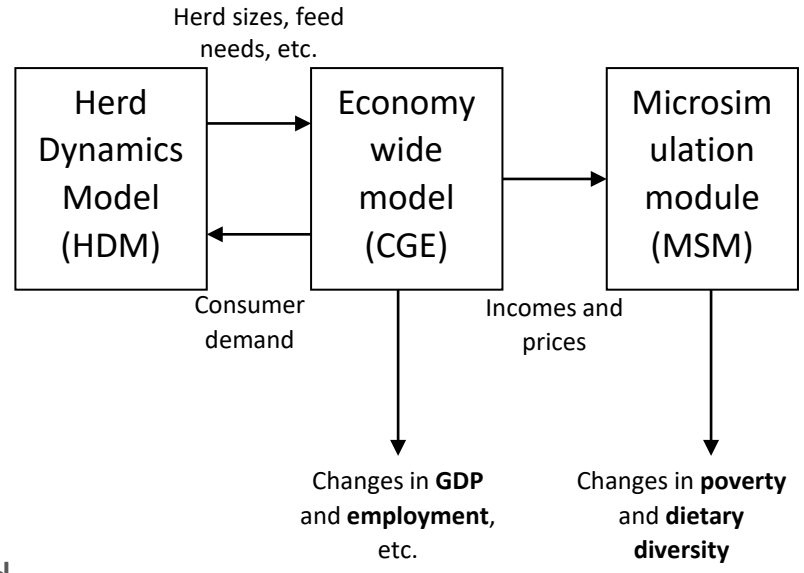
SOLUTION

- For national planning and identifying investment needs, it is crucial to reassess projections and policy priorities.
- We developed a more sophisticated integration of advanced economic modeling with traditional herd dynamics.
- This tool allows us to quantify in a more consistent way
  - the linkages between economic growth and agri-food system transformation, and
  - develop trajectory of the livestock system.

Fig.: Integrated modeling framework with information flows and outcome indicators



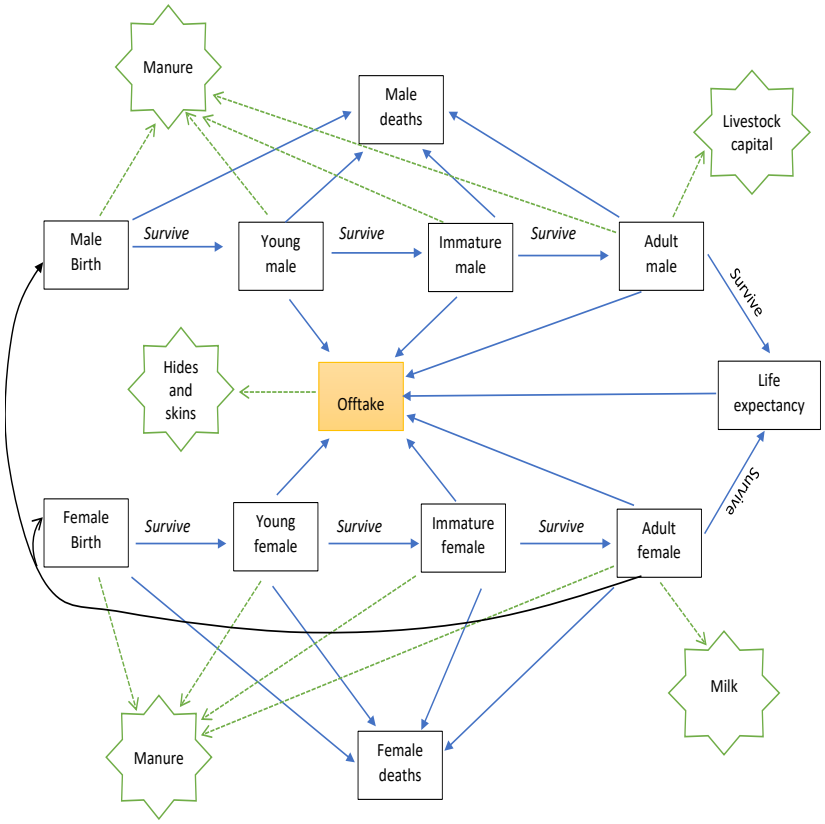
HERD DYNAMICS MODEL

The HDM:

- Feature: tracks herd sizes disaggregated by age, sex and breed.
- Inputs: utilizes baseline stock, indicative birth, death, offtake and intake rates
- Outputs: system consistent births, deaths and offtakes, meat, milk production.

- **Nature of the data**
  - Currently focusing on cattle
  - Ethiopia's Agric. Sample Surveys (ASS).
    - The data runs from 2003 – 2017
  - Survey reports cattle by five major age groups by sex
  - We build the cattle database for 5 agro-ecological zones.

Fig.: Schematic representation of herd dynamics- e.g.: cattle



LINKING TO ECONOMIC MODEL

- **Data transformation and demographic variables computation**
  - 13 single-year age class cattle database – from 5 class
  - Transform the data to create smoothed, demographically consistent life-table.
- **Linking the demographic information to the gams based HDM**
  - Once internally consistent demographic parameters are computed, export to the HDM.
    - Smoothed baseline data – for 2016/17
    - Fertility rate, death rate, offtake rate, etc
- **Interacting the HDM and the core CGE model –> bi-directional**
  - From the HDM – feed demand, livestock capital trend for the meat and milk activity
  - From the CGE model – activity prices (meat and milk offtake rates), input availability (live-weight, etc.)

FOUR FUTURE SCENARIOS

- Baseline – using a core CGE model for Ethiopia - 8 livestock products.
  - 6.5% GDP growth with current pace of urbanization (+5 %-points by 2030)
- Four future economic-demographic scenarios
  - Rate of economic growth (4.0% vs. 9%)
  - Rate of urbanization (no change in pop share by 2030 vs. +5%-points by 2030)

	Slower urbanization (no change by 2030)	**Faster urbanization** (+5%-points by 2030)
Slow growth (4%)	1	2
Fast growth (9%)	3	4

- Hypothetical growth and urbanization scenario to provide a risk-based approach to the prospects of the livestock sector.
- Results reported as deviations from baseline trajectory.

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RESULTS | LIVESTOCK IN THE ECONOMY

- **Demand for ASF heavily depends on economic-demographic changes**
  - Income growth main driver of overall livestock system expansion
  - Urbanization shifts the composition of livestock system towards proc. ASF

Fig.: Percentage points deviation from baseline growth

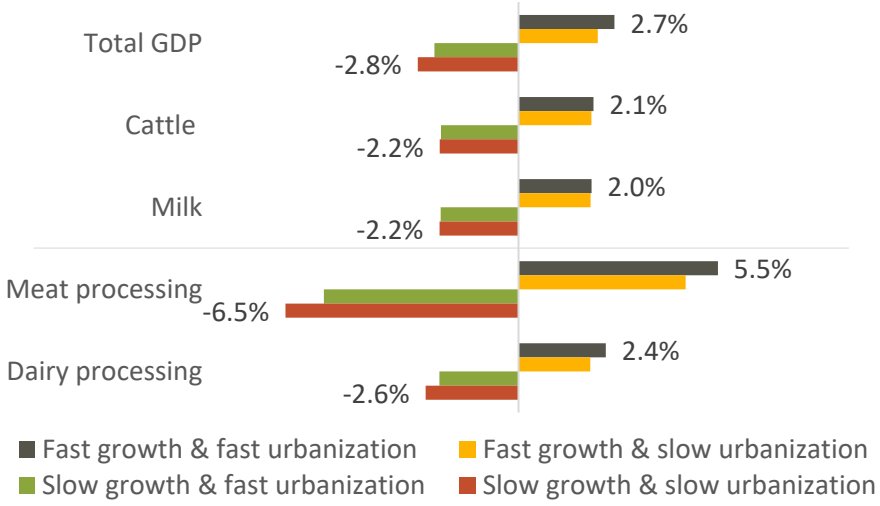
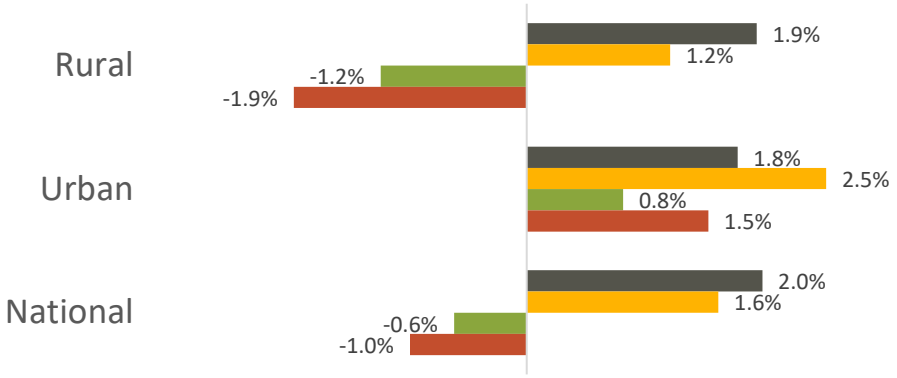


Fig.: Percentage points deviation from baseline change in livestock product consumption



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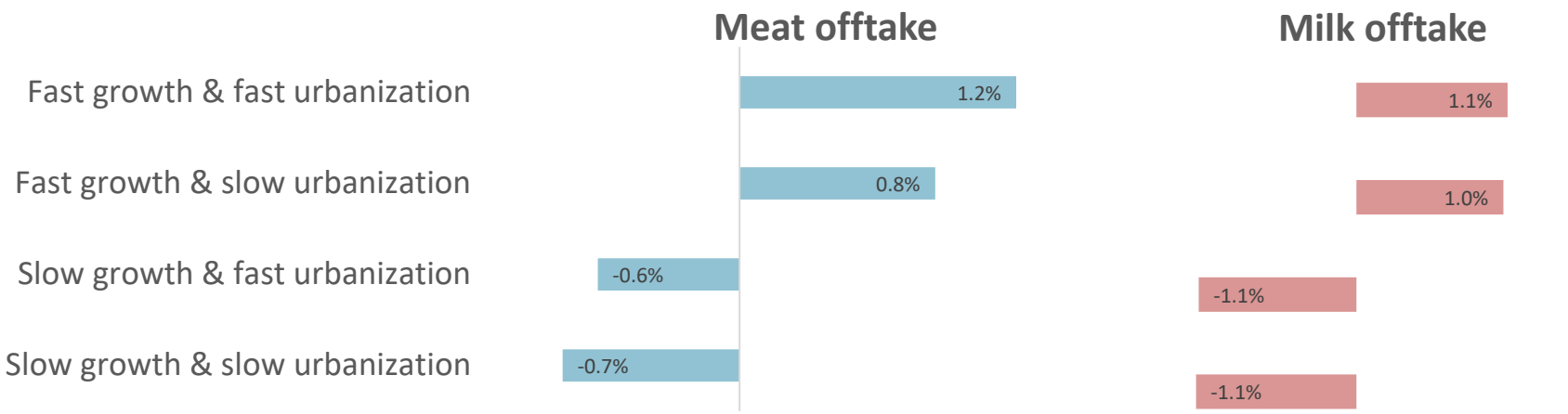
RESULTS | HERD DYNAMICS

- **Consistent results within the HDM framework**
  - High economic growth is linked to high meat and milk offtake levels
  - High urbanization leads to higher meat offtake rate, but not to a clear increase in milk offtake.

Fig.: Percentage points deviation from baseline change in meat and milk offtake



CONCLUSION

- **Demand for ASF heavily depends on economic-demographic changes**
  - Income growth main driver of overall livestock system expansion
  - Urbanization shifts the composition of the livestock system towards processed ASF product
- **Livestock development plans should reflect economic reality & potential risks**
  - Previous LMP may have overestimated economic growth & hence resource needs (but not priorities)
- **Integrating economywide & livestock systems models can strengthen basis for planning**
- **Modeling component of the IFPRI project continues until August**
  - Identifying future development scenarios for Ethiopia's livestock system
  - Evaluating drought damages and recovery scenarios

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Thank you!

For further questions and comments: e.aragie@cigar.org

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