MINISTERIO DE GANADERÍA
AGRICULTURA Y PESCA

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Low-carbon development of the beef cattle sector in Uruguay

CGIAR – CCAFS – ILRI

COP22 Side event: November 7th, 2016

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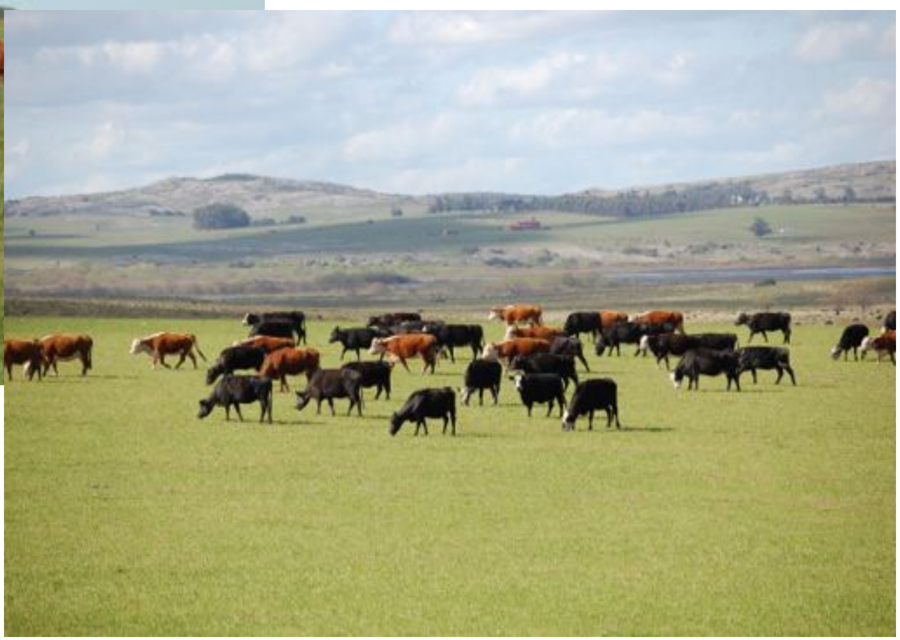
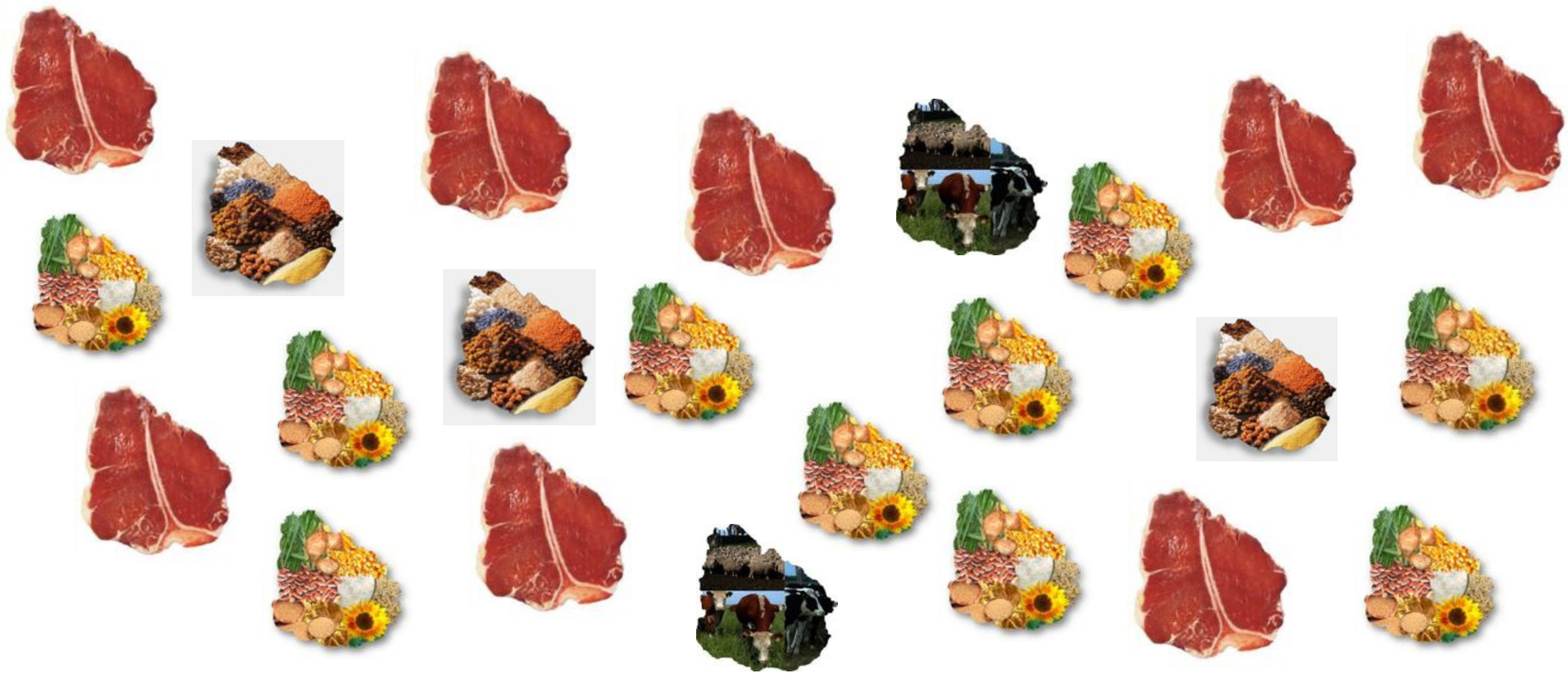
- Uruguay is a livestock country with an economy strongly based on the agricultural sector (70% of all exports).



On the path of growth

**Uruguay has 3.4 million inhabitants
and feeds 32 millions**



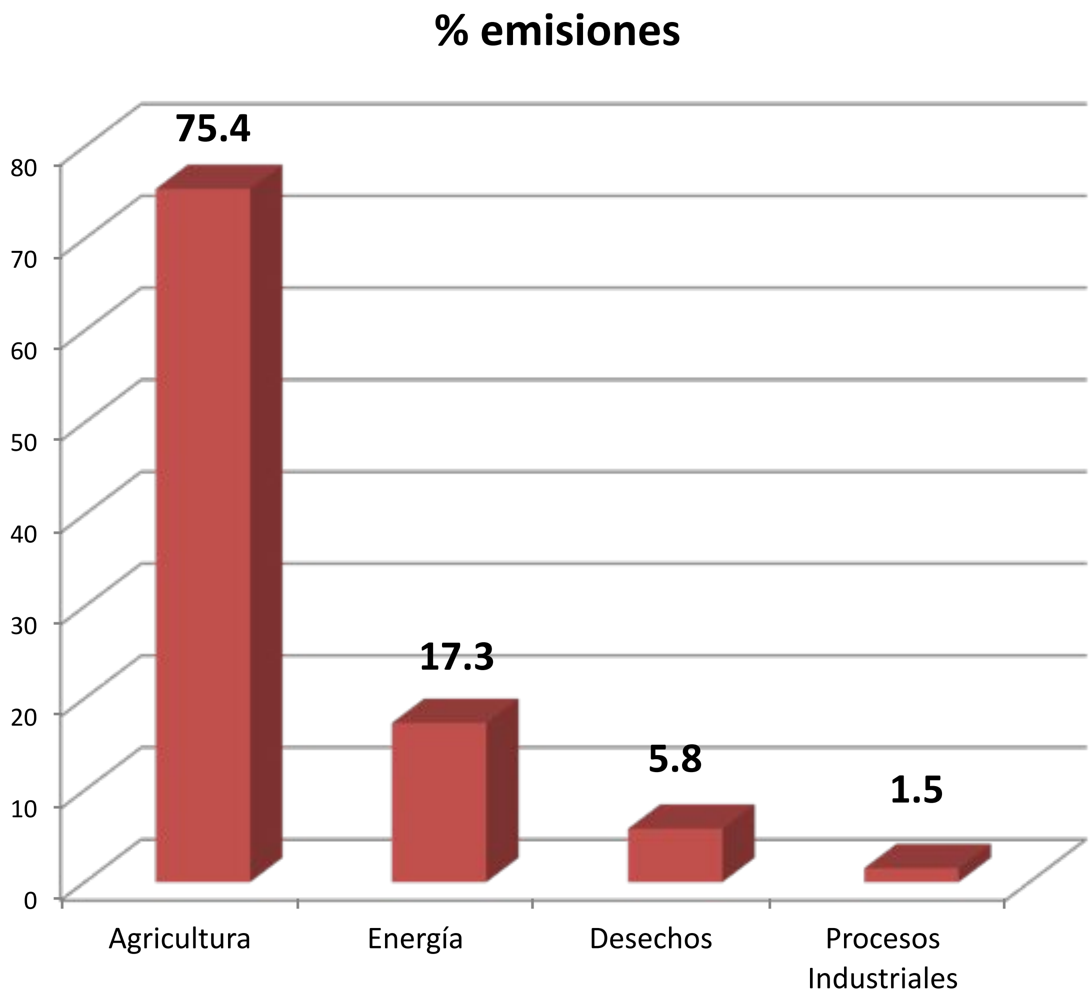
Context: simultaneous targets have to be achieved

1. **More food.**

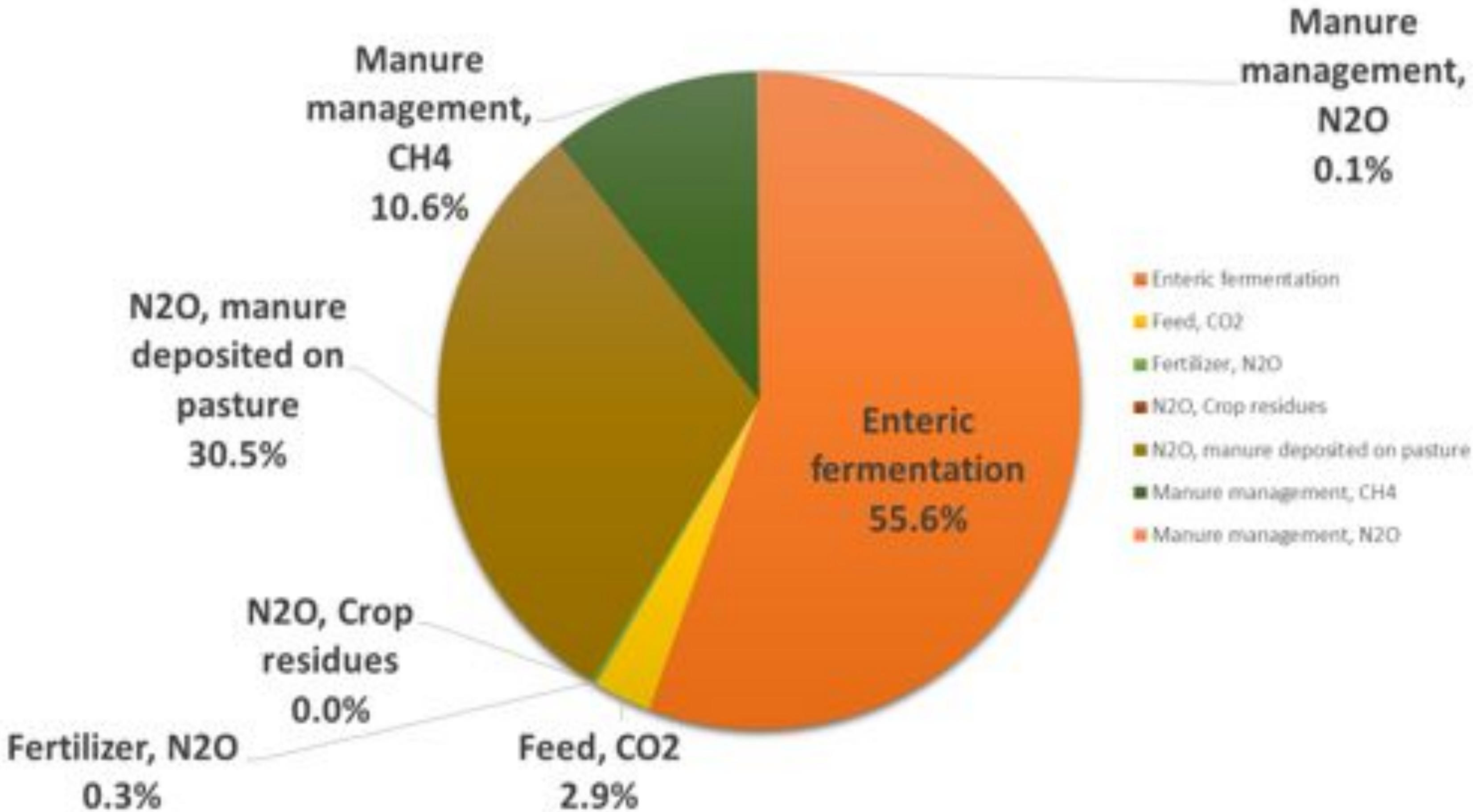
2. **Less environmental footprint.**

3. **Mitigation and adaptation of/to CC.**

Emisiones de Gases de Efecto Invernadero directo – por sector (2010)



MAIN SOURCES OF EMISSIONS



Uruguay´s iNDC: proposed mitigation targets in terms of emissions intensity in the beef sector (per kg beef)

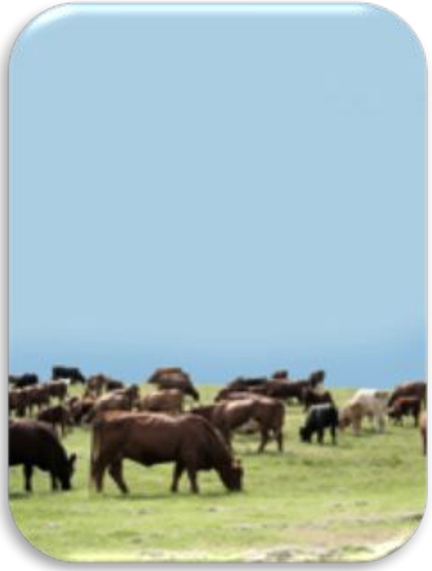
	2030 vs. 1990 own effort	2030 vs 1990 with MOI	2010 vs 1990
CH_4	33% less	46% less	23% less
N_2O	31% less	41% less	28% less

Q1: Uruguay experiences in improving activity data, emission factors and coordination to best capture mitigation impacts

- 🎬 Innovations used to get **activity data** to capture mitigation in the livestock sector.
- 🎬 Data sources that already existed? New data collected?
- 🎬 Do you use production system-level approaches?

National Livestock Information System

SNIG



High quality livestock statistics system

100% traceability of the cattle herd, with electronic and visual tags

Annual electronic sword declararation by all farmers

- Stock: number of heads by category = AD

- Land use → Diet, as basis for estimating sub-national **EF**

Emissions = AD x EF

BEEF HERD COMPOSITION (annual electronic sword declaration)

Departamento / Seccion policial	DICOSE	Bulls	Breeding cows (mated)	Cows for fattening	Steers oldier than 3 years	Steers with 2-3 years	Steers with 1-2 years	Heifers oldier than 2	Heifers with 1-2 years	Male and female	Total number of animals	Mortality	Human consumption
0308	030800257	16	453	54	0	0	100	139	106	229	1097	61	0
0308	030800338	5	173	0	30	84	33	28	25	19	397	10	0
0308	030800648	20	670	0	0	0	6	77	104	305	1182	12	0
0308	030800699	3	98	0	0	0	0	2	29	28	160	0	0
0308	030800982	1	26	0	0	0	0	0	2	46	75	3	0
0308	030801121	7	187	0	10	12	15	41	51	113	436	1	0
0308	030801288	0	4	0	1	1	1	3	0	3	13	0	0
0308	030801504	58	771	0	47	23	40	9	168	543	1659	45	0
0308	030802624	1	79	0	11	15	25	0	0	56	187	0	0
0308	030803043	26	956	43	0	75	460	0	306	695	2561	18	0

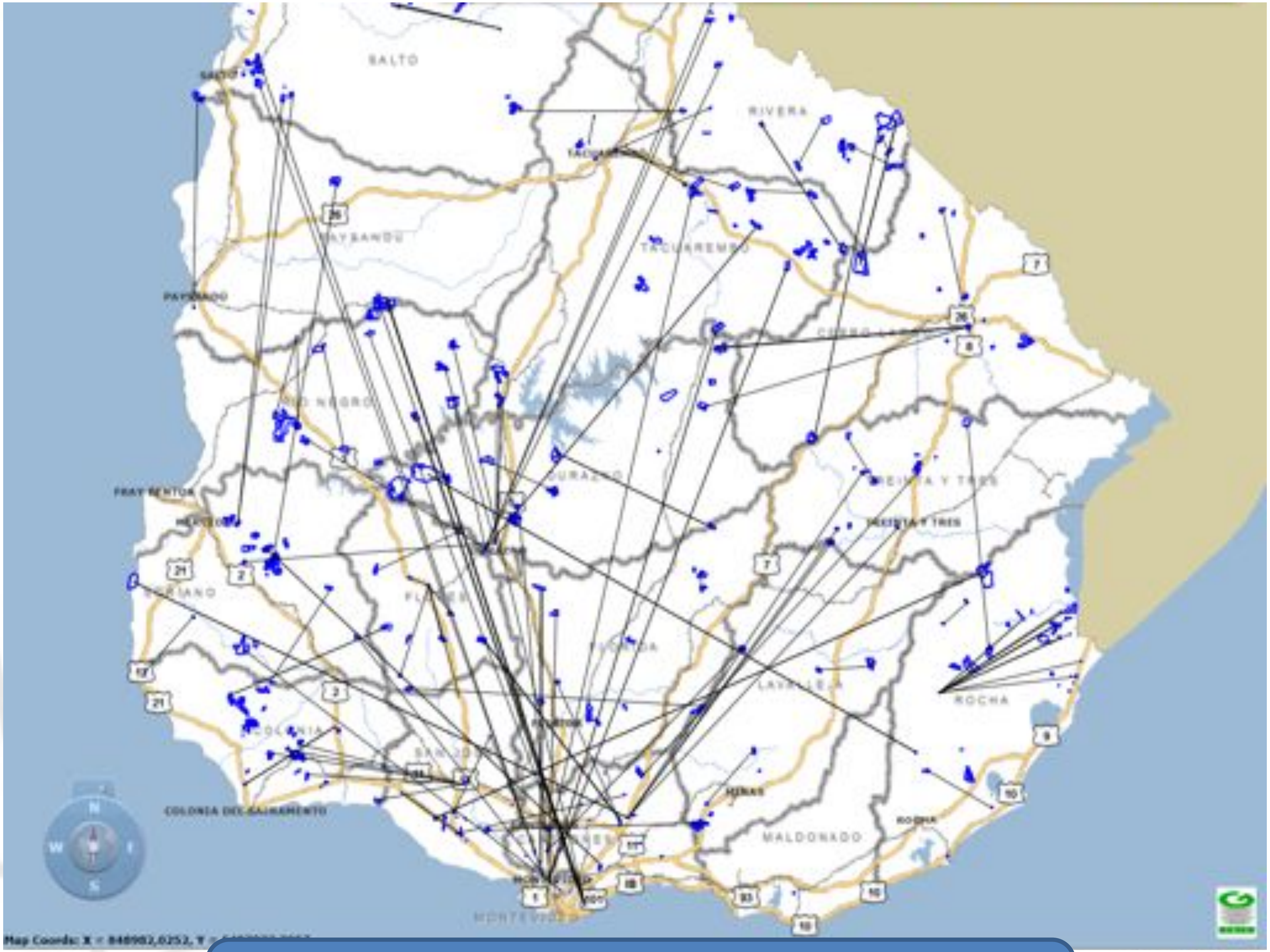
Source: DICOSE, 2012

DISTRIBUTION OF BEEF CATTLE HERD AND PASTURE RESOURCES BY ECOREGION

Uruguay beef cattle herd: 10.8 million head

	SHARE OF ANIMALS BY PRODUCTION SYSTEM					SHARE OF GRASSLAND		
	NUMBER OF CATTLE FARMS	NATIONAL CATTLE INVENTORY	BREEDING	COMPLETE CYCLE	FATTENING	TOTAL AREA	NATURAL GRASSLAND	OTHER GRASSLAND
			%			Million Ha	%	
BASALTO	6321 (15%)	27%	28	28	27	4.1	91	5
SIERRAS DEL E	4776 (11%)	10%	12	9	8	1.4	84	9
LLANURAS DEL E	1791 (4%)	5%	6	5	4	0.72	80	14
CRISTALINO Y LOMADAS	9903 (23%)	24%	24	22	28	3.3	68	22
ARENISCAS Y NE	6212 (15%)	18%	17	22	19	2.4	79	12
LITORAL	4505 (11%)	10%	9	10	17	1.7	52	18
SUR LECHERO	9057 (21%)	5%	4	4	10	0.72	48	38

Source: DICOSE, 2012

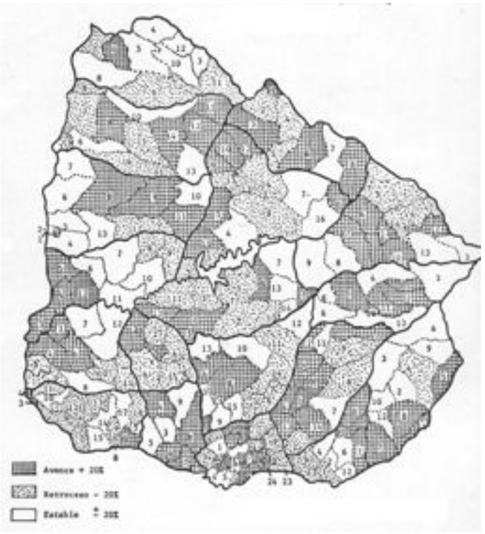


Tracking animal movements

🎬 **What innovations have you used to get emission factors for low emissions production systems?**

IPCC Tier 2 method for Enteric fermentation and N_2O

- Using spatially disaggregated information on cattle herd by category and diet quality and composition.
- C-S EF for enteric fermentation, including Tier 2 MCF
- Tier 2 N_2O from manure on grasslands
- Use of FAOSTAT tools for QA/QC
- GLEAM model under calibration



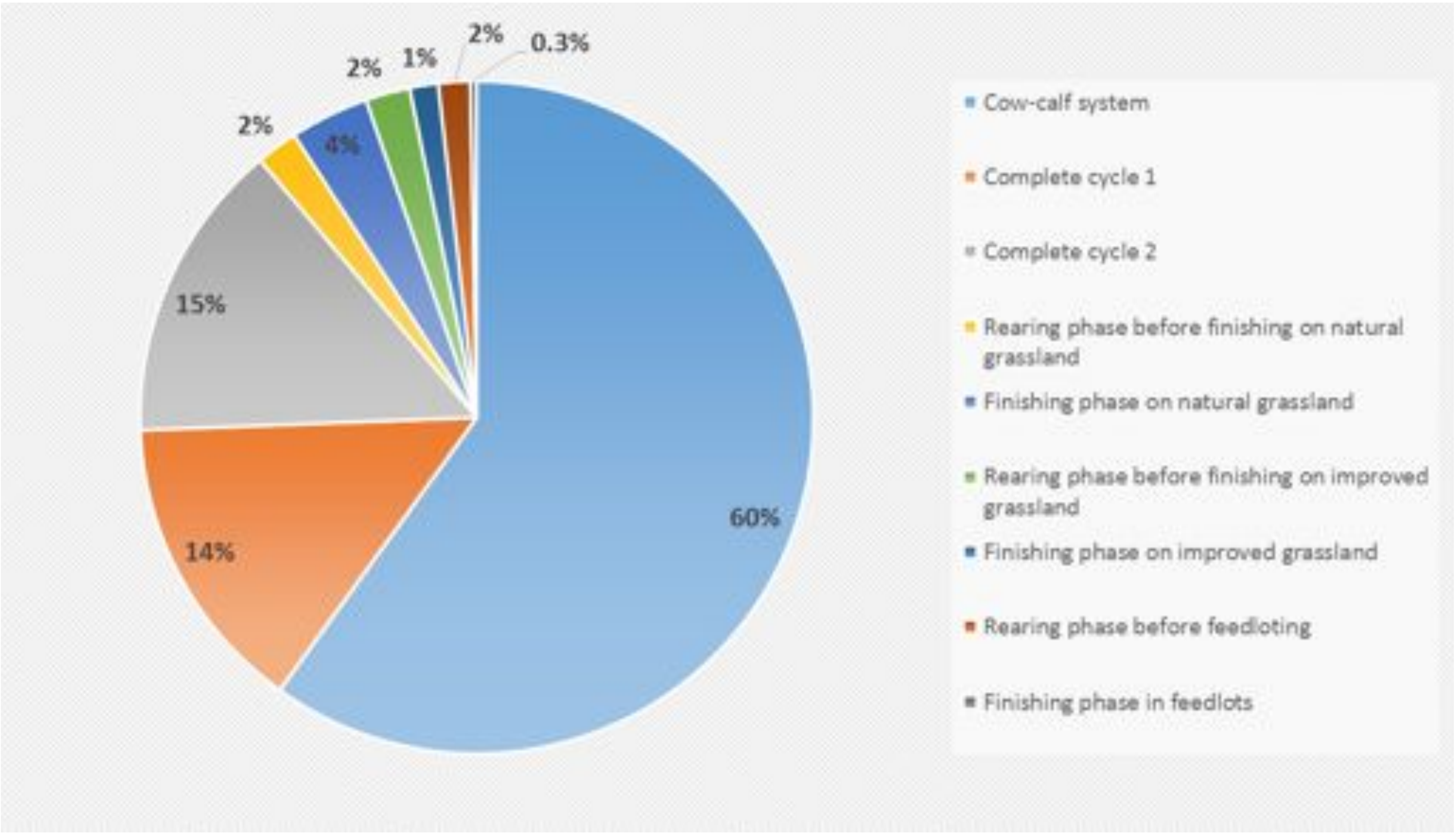
Uruguay is working with FAO to develop and validate Tier 2 models (GLEAM)

- GLEAM is a modelling framework that simulates the environmental impacts of the livestock sector. It represents the bio-physical processes and activities along livestock production chains under a life cycle assessment approach.

URUGUAY CAN CALCULATE AVERAGE WEIGHTED EF FACTORS FOR ENTERIC METHANE (BEEF CATTLE) KG CH4/HEAD/YEAR, BY CATEGORY AND TYPE OF PODUCTION SYSTEM,

Category	Production System	Enteric, CH4
		Kg CH4.head.year
Breeding females	Cow-calf	97
	Complete cycle 1	97
	Complete cycle 2	98
Breeding males	Cow-calf	95
	Complete cycle 1	95
	Complete cycle 2	95
Replacement heifers	Cow-calf	47
	Complete cycle 1	47
	Complete cycle 2	47
Replacement males	Cow-calf	69
	Complete cycle 1	69
	Complete cycle 2	70
Heifers for fattening	Complete cycle 1	73
	Complete cycle 2	74
	Rearing phase	32
	Finishing phase on natural grassland	63
Steers 2-3 years	Complete cycle 1	76
	Complete cycle 2	76
	Rearing phase	38
	Finishing phase on improved grassland	59
Steers older than 3 years	Complete cycle 1	85
	Complete cycle 2	85
	Rearing phase	38
	Finishing phase on natural grassland	75

CONTRIBUTION OF PRODUCTION PHASES TO ENTERIC CH4 EMISSIONS



SUMMARY OF FEATURES OF BEEF EMISSIONS

- Main sources: enteric CH4 and nitrous oxide from manure
- Pasture-based systems (cow-calf and complete cycle systems) contribute bulk of emissions
- Key drivers of emissions and emission intensity
  - **Breeding system**
    - ✓ Inadequate and poor nutrition: quality, seasonality
    - ✓ Poor reproductive efficiency: low fertility, low weaning rates, high AFC
    - ✓ Large breeding overhead
    - ✓ Low adoption of improved management practices
  - **Rearing and finishing**
    - ✓ Long and inefficient rearing and finishing periods
- Large variability of emission intensity between and within systems

Q 3: 🎬 How does Uruguay coordinates collection of data? Aggregating across local level administration? Coordinating projects and national efforts? Across universities, private sector companies and the public sector/government?

Goals for the climate smart project with GEF-FAO in Uruguay

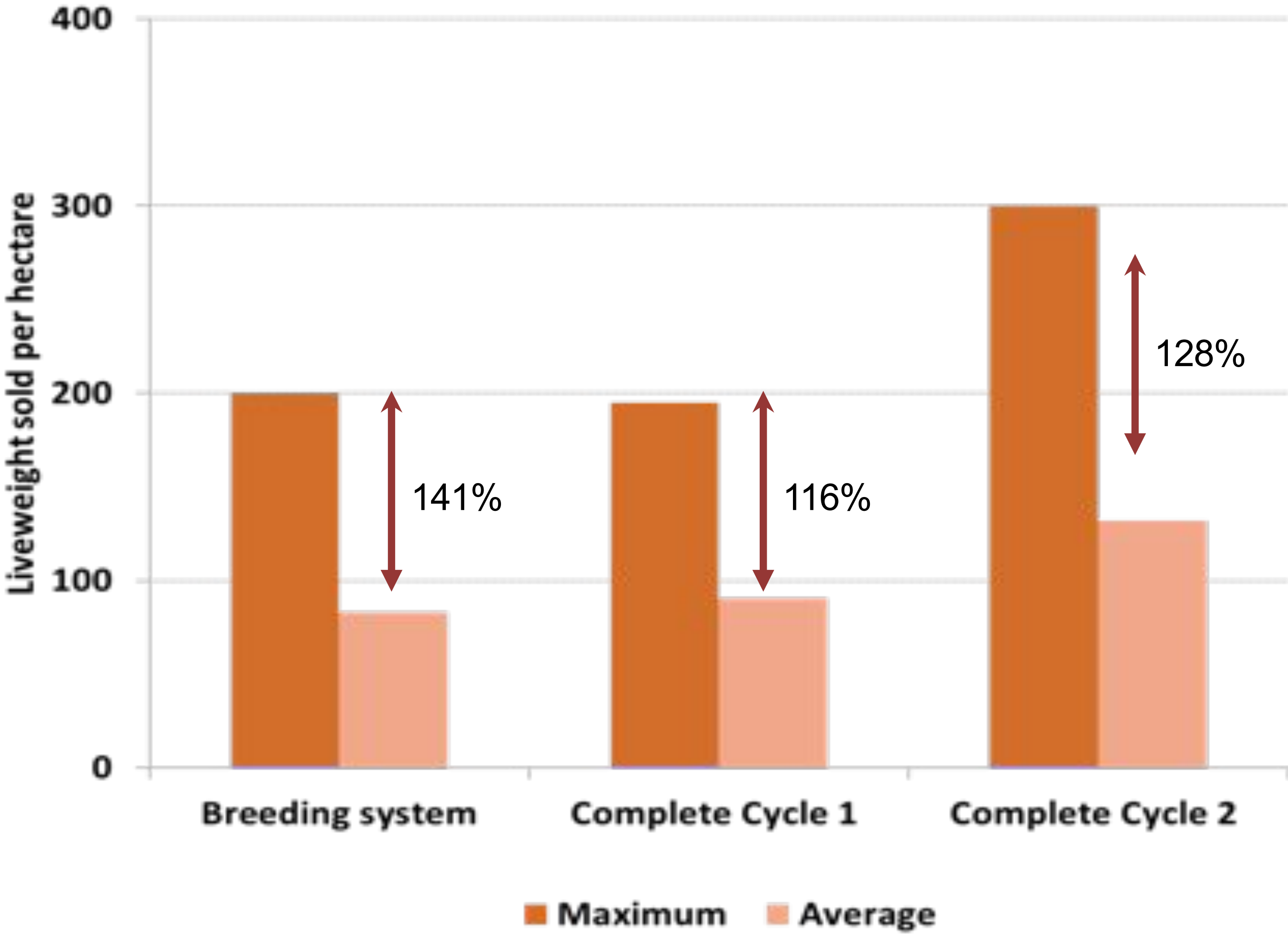
- To mitigate climate change while increasing productivity and resilience.

- Prepare a **NAMA** and develop **MRV** tools to scale-up.

Strategy

REDUCING ENTERIC METHANE EMISSIONS INTENSITY THROUGH IMPROVED PRODUCTION EFFICIENCY AND PRODUTIVITY OF CATTLE IN BEEF PRODUCTION SYSTEMS IN URUGUAY

PRODUCTIVITY GAP



SELECTED INTERVENTIONS FOR URUGUAY

1. Increasing forage allowance: *90% herd is managed on natural pastures* → **better management of forage resources by matching available forage resources to animal requirements**

2. Inter-seeding pasture with grass legumes → **improving quantity and quality of the basal diet**
- native pastures over sown with legumes to increase pasture yield and quality

3. Sowing grass legume mixtures and annual fodder crops

4. Strategic feeding & supplementation
- winter and summer supplementation
- Dietary flushing

→ **overcome winter and summer deficits**
- **address energy and protein constraints during periods of low availability and quality**

5. Controlled breeding: defined mating season → **timing of mating to match nutritional requirements of herd to the seasonal pasture supply pattern**

6. Genetics:
- Heterosis, new breeds, genetic improvement

→ **genetic management to improve reproductive traits**

CONCLUSIONS

- A number of practices are available which have potential to reduce EI relative to baseline practices.
- Potential to reduce emission intensity ranges from 23% - 47% of the baseline emissions.
  - ✓ Aligns with Uruguay's INDC commitment: reduction of emission intensity by 33%
- Strong synergies with gains in productivity gains and profitability
- Despite this, rate of adoption of these technologies is still at low

  - need to quantify other benefits: carbon sequestration, increased grassland productivity, biodiversity, increased resilience
  - testing on the ground required: to better understand barriers to uptake, costs of implementation,
  - agro-technologies are highly location specific, technology targeting in terms of ecological conditions, socio-economic condition of farmers

Thank you!

STOP GLOBAL WARMING