

Effects of climate change on Poultry Production

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Poultry production in the world

- ▶ Poultry production is probably the most dynamic livestock sector in the world.
- ▶ The main reasons for that are:
 - ▶ Low retail price
 - ▶ No connection to religious or cultural restrictions
 - ▶ Easy meal to prepare
 - ▶ Lots of processed products
 - ▶ Very nutritious
 - ▶ Connected to healthy diets and child development

TABLE 1: World balance for meats by type

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	Million metric tons			% change 2017 over 2016
	2015	2016*	2017**	
Total production	320.5	321	322	0.3
 Bovine meat	67.6	68.3	69.6	1.9
 Poultry meat	116.9	117.2	117.7	0.4
 Pig meat	116.1	115.6	114.7	-0.8
 Ovine meat	14.4	14.4	14.5	0.6
Total trade	29.9	31.2	32	2.5
 Bovine meat	9.2	8.9	9	0.8
 Poultry meat	12.2	12.8	13.2	2.9
 Pig meat	7.2	8.3	8.6	4.1
 Ovine meat	1	0.9	0.9	-2
Supply and demand indicators				
World per capita food consumption (kg/year)	43.5	43.1	42.7	-0.9
FAO meat price index (2002-04=100)	2015	2016	2017 (Jan-May)	% change: Jan-May 2016 over Jan-May 2015
	168	156	165	11.4

*Estimate **Forecast

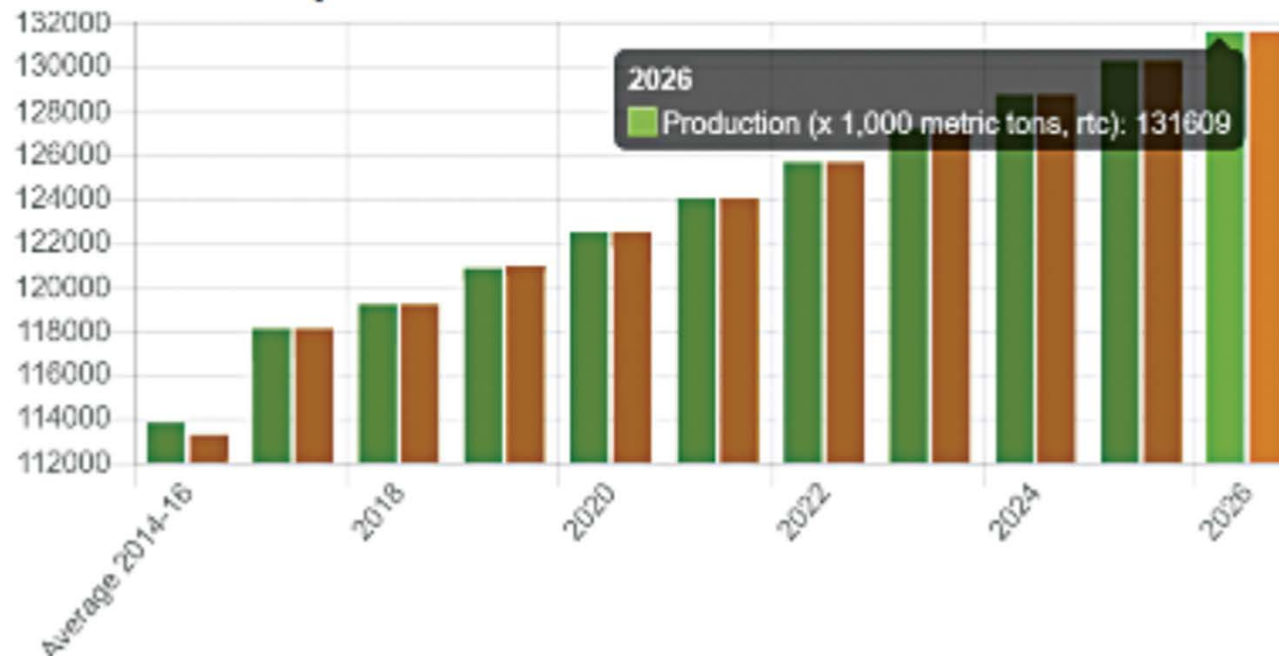
Source: FAO Food Outlook June 2017

Future projections

- ▶ In the years to come the rise in the consumption and production of poultry meat is expected to continue (16% in the next decade)
- ▶ This increase is mainly due to the growth of the world's population, which is expected to exceed 8 billion in 2026.
- ▶ This increase will apply mainly to the urban population in developing countries who is characterized by an improved standard of living and consequently increased consumption of animal protein.

World poultry meat production and consumption projections to 2026

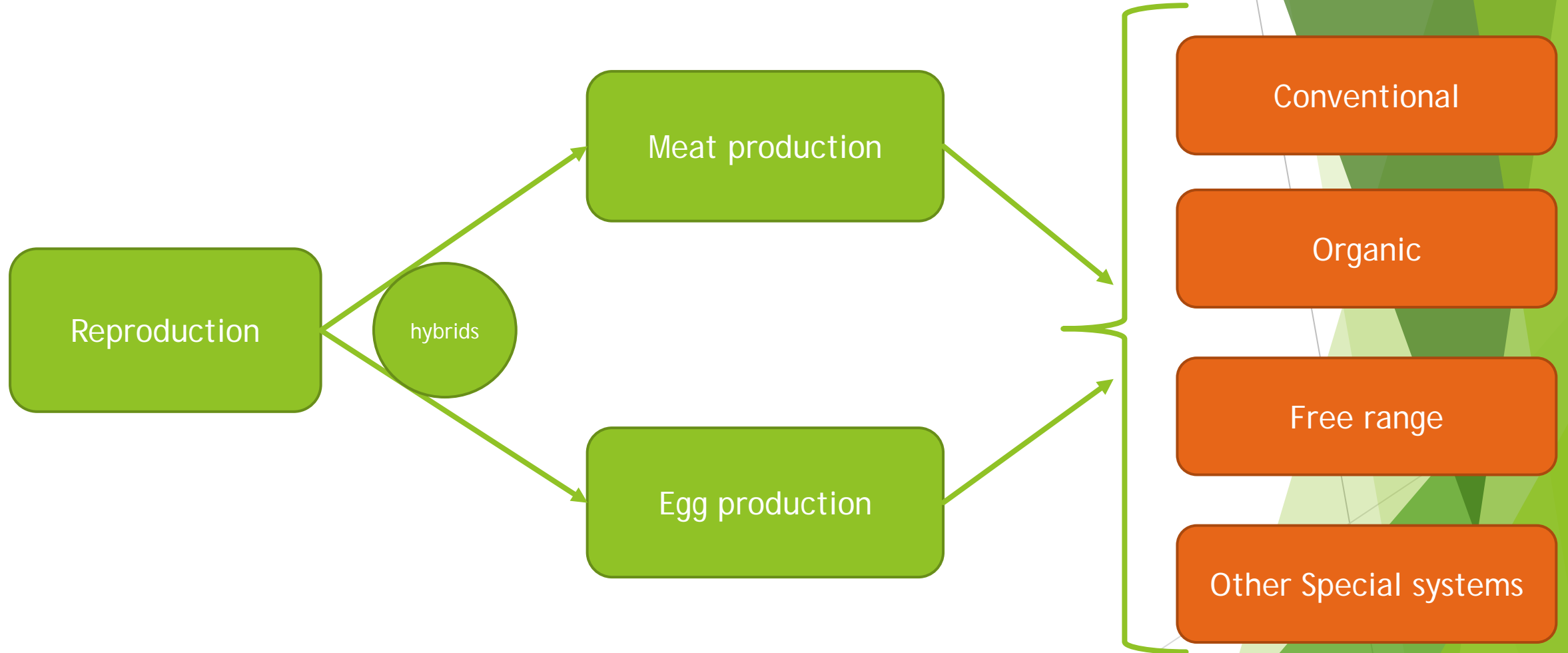
Source: OECD-FAO Agricultural Outlook 2017-26



Why so optimistic projections?

- ▶ Poultry production takes place in facilities where the environmental conditions are fully controlled, without being directly dependent on the weather conditions and their sudden changes. This ensures a stable and safe source of animal protein for the world's population.
- ▶ Poultry production has low production costs due to the possibility of large-scale production and due to the low FCR which is the smallest and most efficient among farm animals.
- ▶ The smallest amount of food per kg of produced body weight results in the poultry meat being the meat with the smallest pressure on the environment during its production since it requires the least area of land per kg of product for feed production.

Structure of poultry production



Conventional



Organic



Free range



Other Special systems



High stocking density

Short rearing time

Dependence on
feedstuff availability

Major impacts of climate change that affect poultry production

- ▶ Surface temperature increase (heat stress)
- ▶ Higher incidence of extreme climatic phenomena (precipitation, heat, wind etc.)

Heat stress effects on poultry production (1)

- ▶ Behavioral changes: The birds will alter their behavior seeking thermoregulation
 - ▶ Less time feeding, moving or walking
 - ▶ More time drinking and resting
- ▶ Physiological changes: attempts for thermoregulation and homeostasis
 - ▶ Increased CO₂ levels and higher blood pH (reduced bicarbonate availability, soft egg shell)
 - ▶ Reproductive problems (reproductive hormones, semen quality)
 - ▶ Growth rate (increased corticosterone, decreased T₃, lipid metabolism)
 - ▶ Immune system (immunosuppression, less antibodies, lower weight of spleen and thymus)

Heat stress effects on poultry production (2)

- ▶ Reduced feed intake
- ▶ Lower body weight
- ▶ Higher FCR
- ▶ Higher fat deposition
- ▶ Less breast muscle
- ▶ More thigh muscle
- ▶ Lower protein content
- ▶ Lower egg production

128-165 million \$ losses in
the USA

Indirect effects

- ▶ Poultry production depends on the production of feedstuffs
- ▶ Grazing is not a common practice in the conventional systems
- ▶ Even in free range or organic systems that grazing is performed, it does not contribute significantly to the feeding of the birds.
- ▶ The production and availability of feedstuffs is expected to be highly affected by climate change in the future.
- ▶ A large proportion of the cost is expected to be transferred to the final product.
- ▶ Human-animal competition for feed?

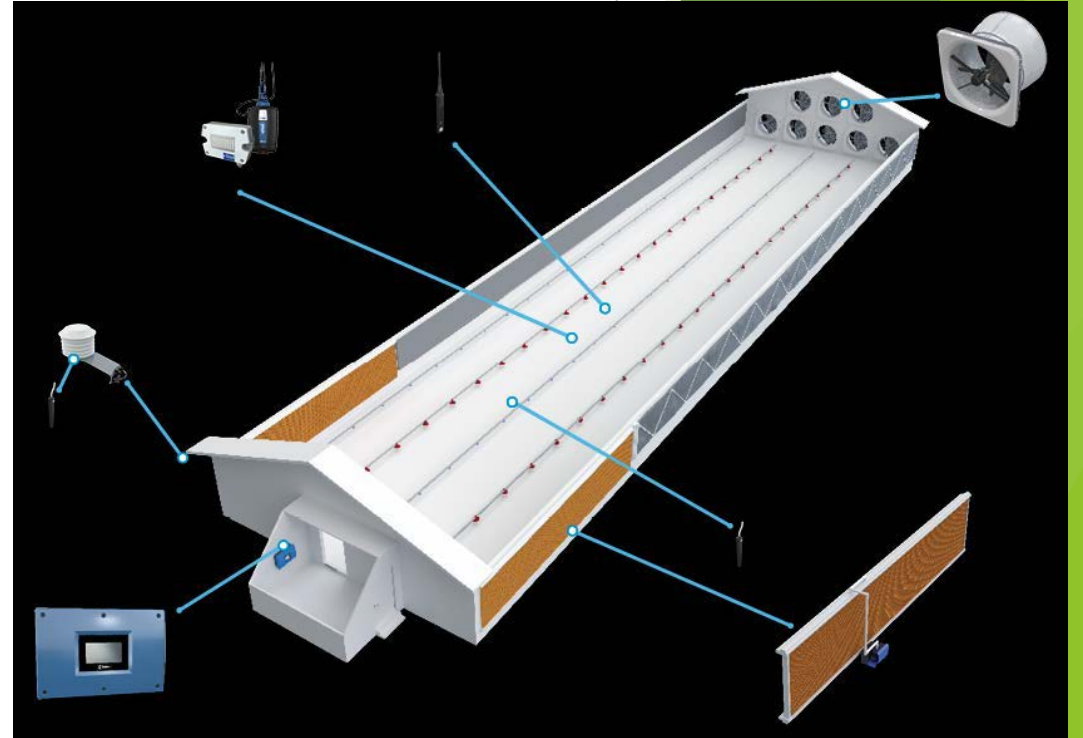
Adaptations to climate change

- ▶ Breeding
 - ▶ Local breeds (African-Fayumi) have genes linked to heat resistance
- ▶ Feeding
 - ▶ Several additives have shown positive impacts during heat stress (probiotics, oxidizers, essential oils)
 - ▶ Feed formulation (better protein micro-adjustment)
- ▶ Improvement of outdoor spaces
 - ▶ Shading (trees, shading constructions, mixed crop livestock systems, agroforestry)

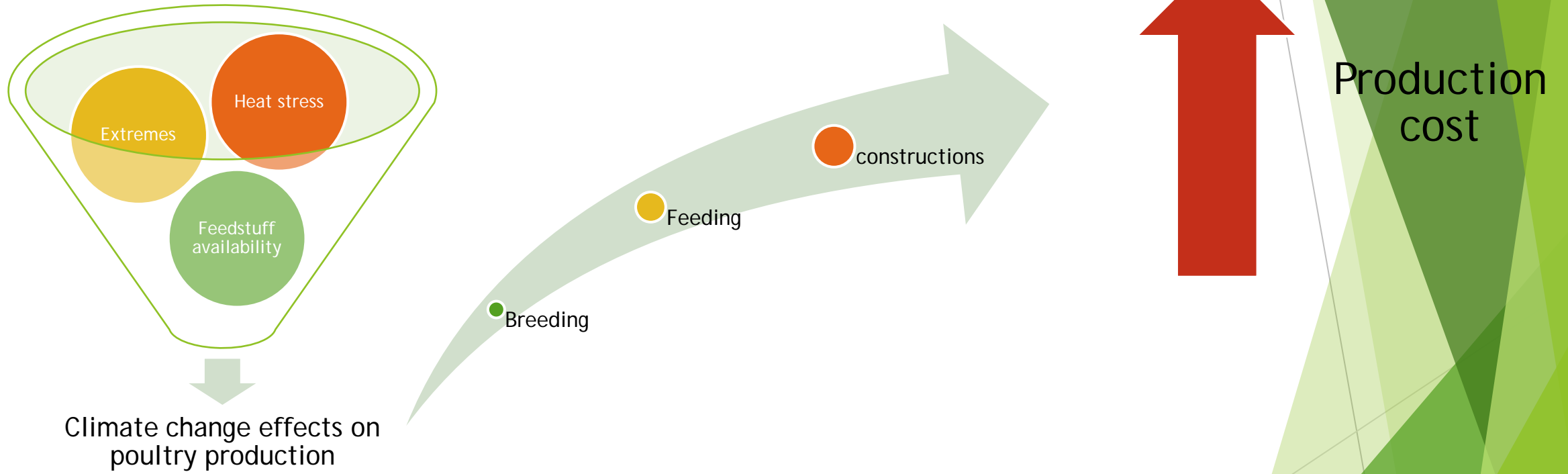
Adaptation of facilities

- ▶ Better insulated buildings
- ▶ Airconditioning
- ▶ Lower stocking densities

Elevated cost



Conclusions



Thank you for your attention