

Biotechnology Options for Ethics and Welfare in Poultry Production

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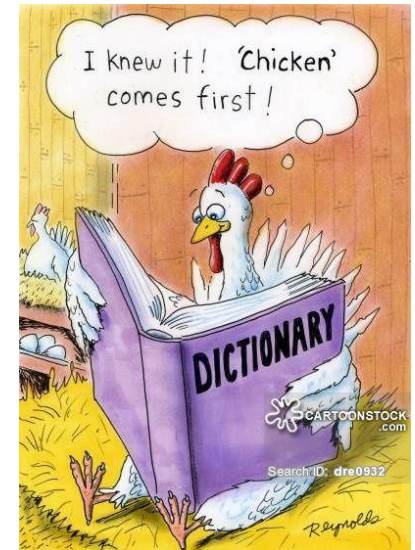
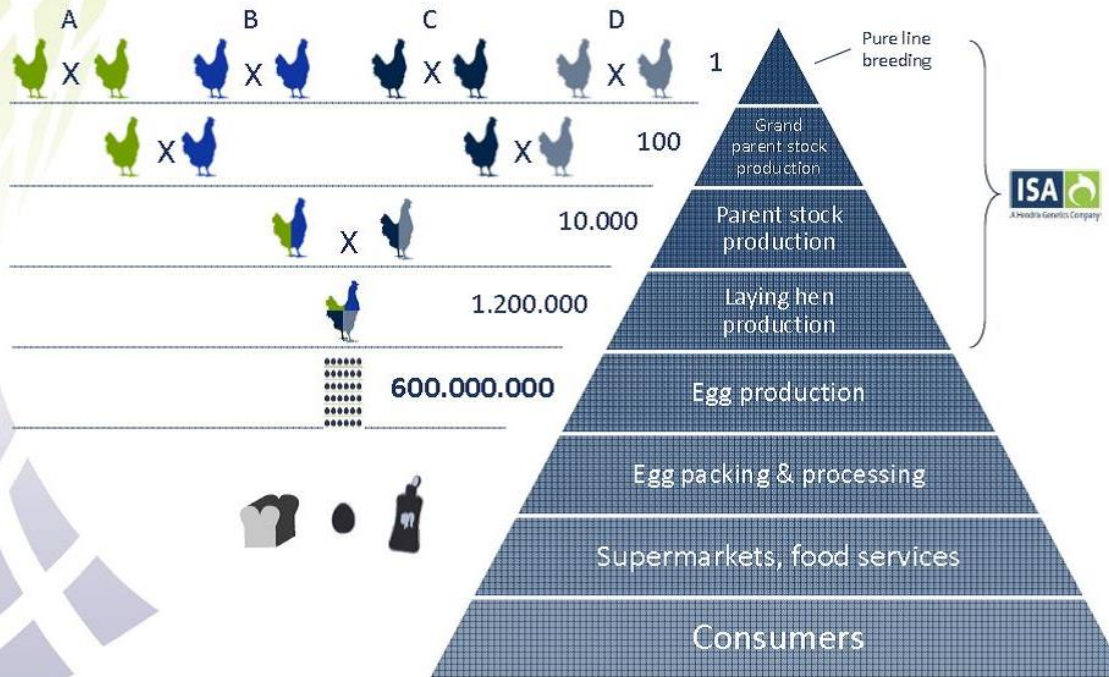


Welfare and production traits

- Key production traits are being elevated by selective and marker assisted breeding
- GE could provide a new tool to smooth that process
- Potential to decouple homozygous deleterious traits (commercial information) from key beneficial production traits
- Ultimately “in house” activity for each poultry genetics business

Layer Hens - Egg Production

Egg Production Supply Chain in 2020 !

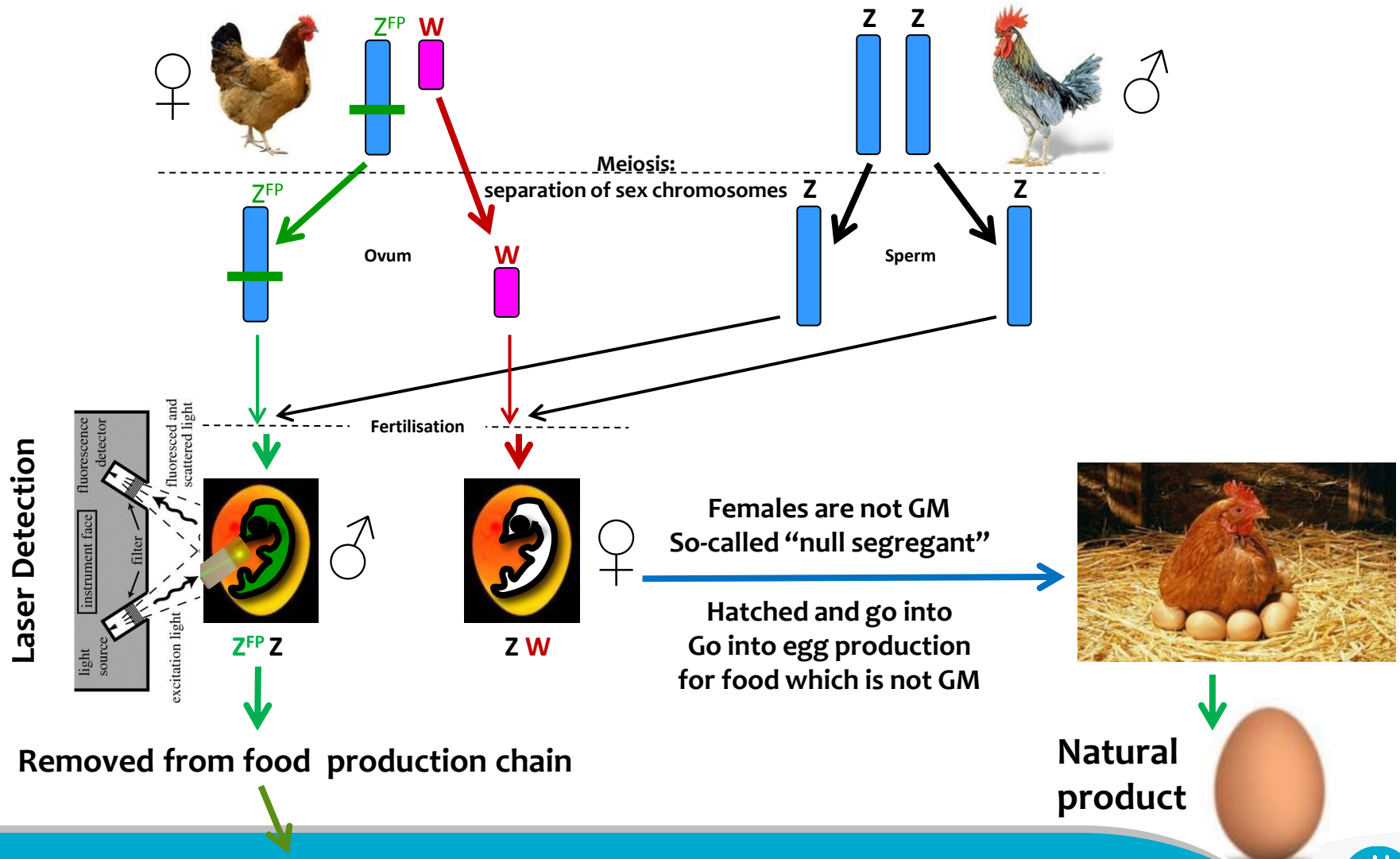


From: <http://www.hendrix-isa.com/en/products/isa-brown/>

NB Figures are for just one of five layer line, of one manufacturer for one marketplace – multiply several fold for the global market.

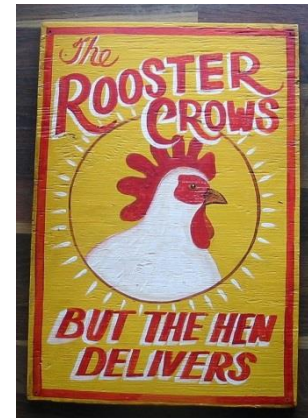
When is GM not GM? That is the question. When it is null segregation.

A biotech approach to a sex selection system for egg laying hens...



Value add by coupling novel trait to selective marker

EGFP chickens via Tol2 integration

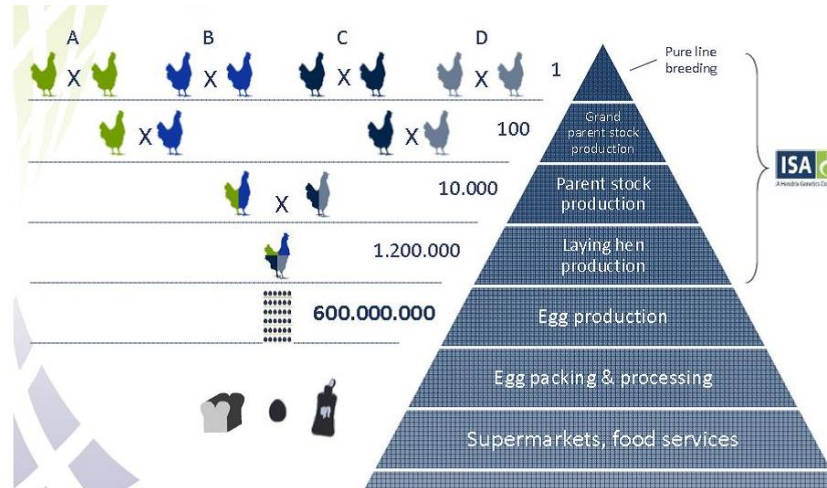


- We can achieve this at predictable efficiency
- 10% of integrations end up on the Z chromosome (because it is large)
- Working toward precision placement
- Working on selective marker to best integrate with industry (alt. to EGFP)
- Also working on what to couple with it
 - Value added trait placed on the males diverted from the hatching process for layer hens

Who will make the decision? Regulators?

Consumers?

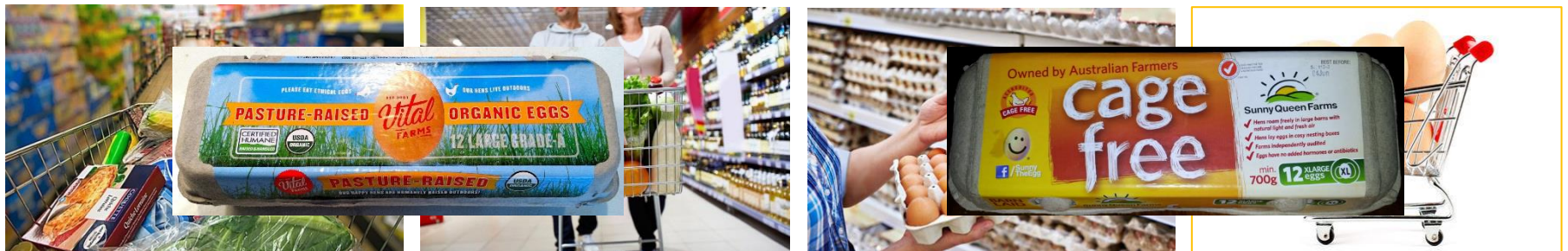
Layer - Egg Production



THE END-USER

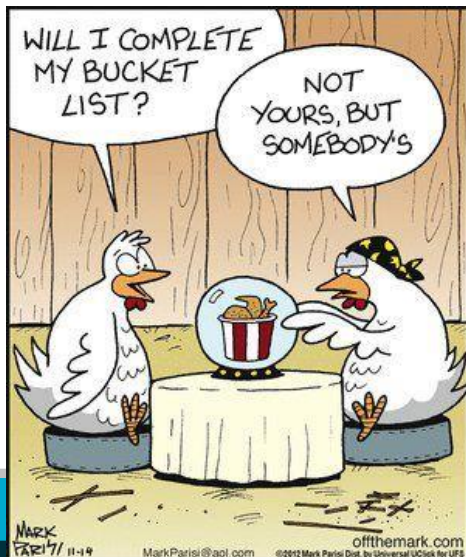
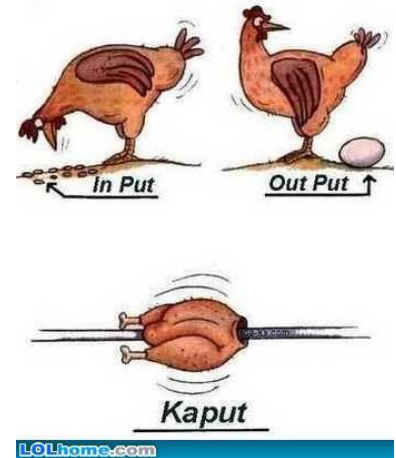
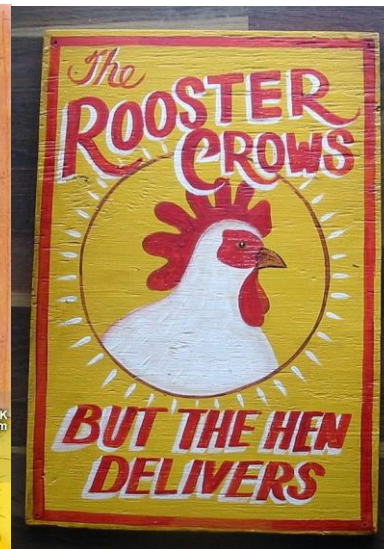
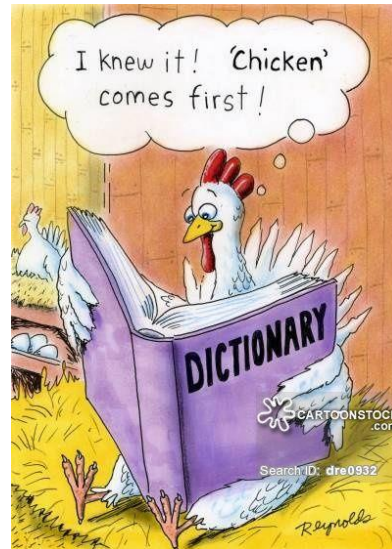
“THE CONSUMER”

THE PUBLICS

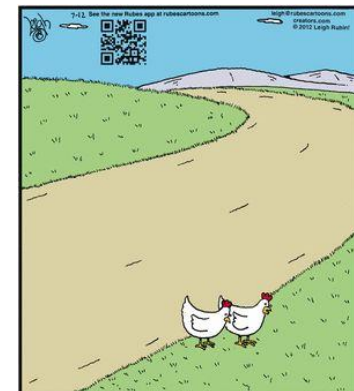


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Chicken Lifestyle



Upon Bernie's arrival, the scariest-costume competition was about to get a whole lot stiffer.



"Yes, I know it's supposed to be the journey and not the destination, but after all the hype, somehow I expected more."