

International Rumen Pangenome Program



This project is funded by the following organisations and the Australian Government's Filling the Research Gap Program



THE UNIVERSITY OF WESTERN AUSTRALIA
Achieving International Excellence



Australian Government
Department of Agriculture



Rumen Pangenome Program – an Australian investment in strategic science

Introduce you to the program and our interest in the connection between the host and its ruminal microbial population



Rumen Pangenome Program

- What's it about?
- Structure and international linkages
- The program

Pangenome – what's it about?

- The full complement of genes in a species
- A superset of all the genes in all the strains of a species
- Reducing methane
 - Challenge - extend the pangenome concept to link the host genome to its ruminal microbiome

Why?

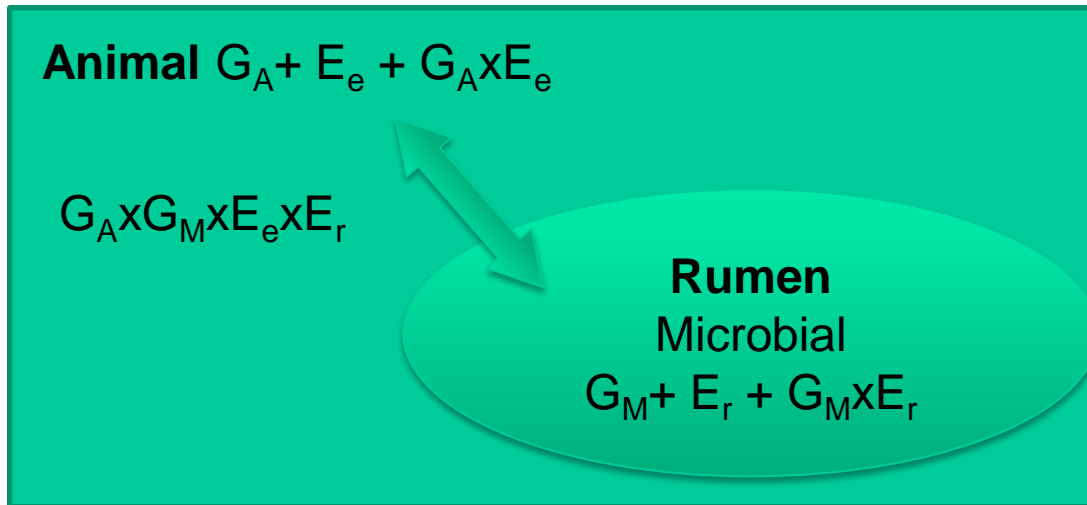
Rumen Pangenome Program

To maximise our impact on methane emissions and productivity we have to optimise G x E x M

Understand genes influencing efficiency:

- within the host
- within the microbiome
- between the host and microbiome (more generally, the gastrointestinal tract).

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Animal $G_A + E_e$

Microbial $G_M + E_r$

G_A – animal G

E_e – external E

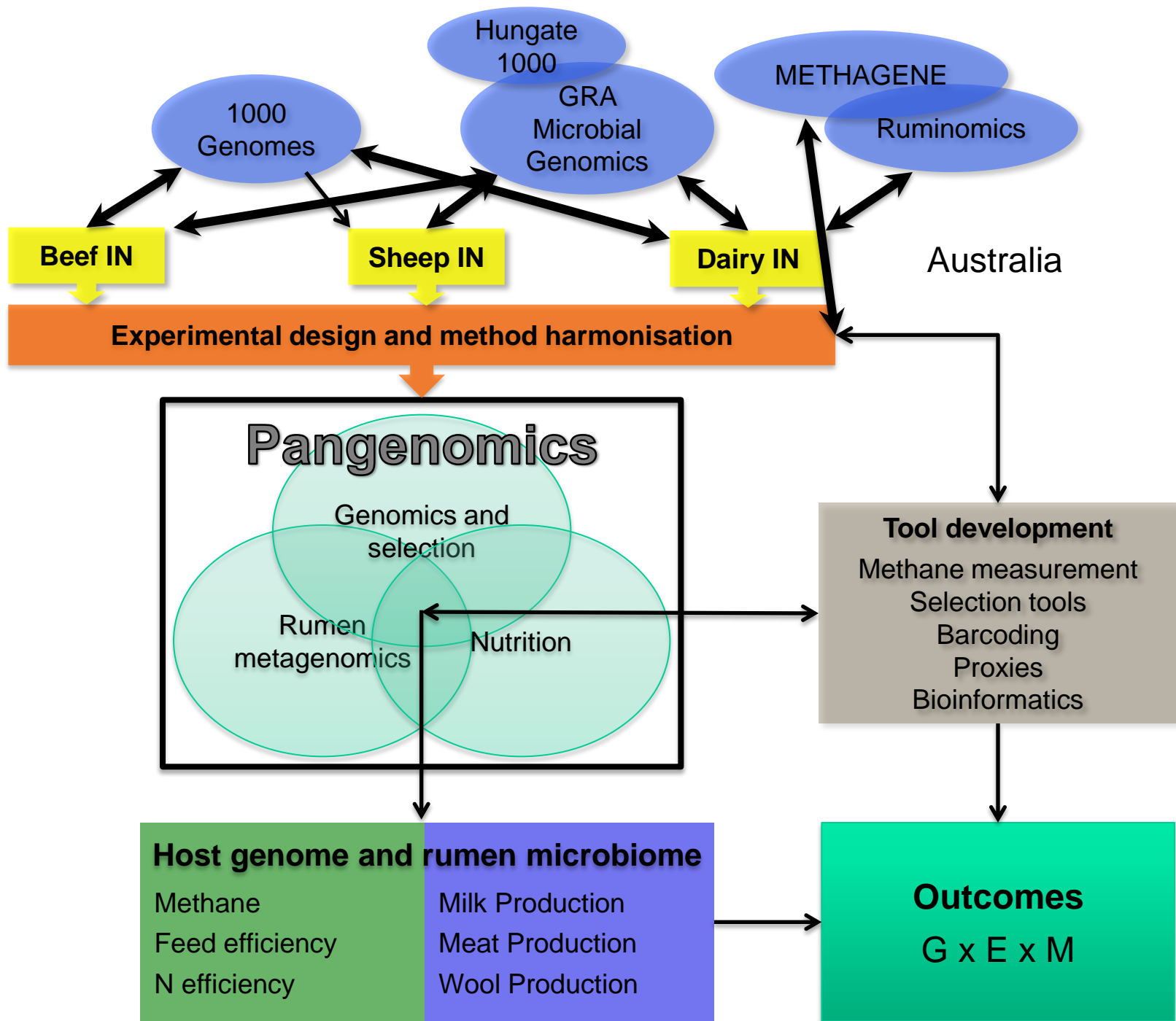
G_M – microbial G

E_r – rumen E

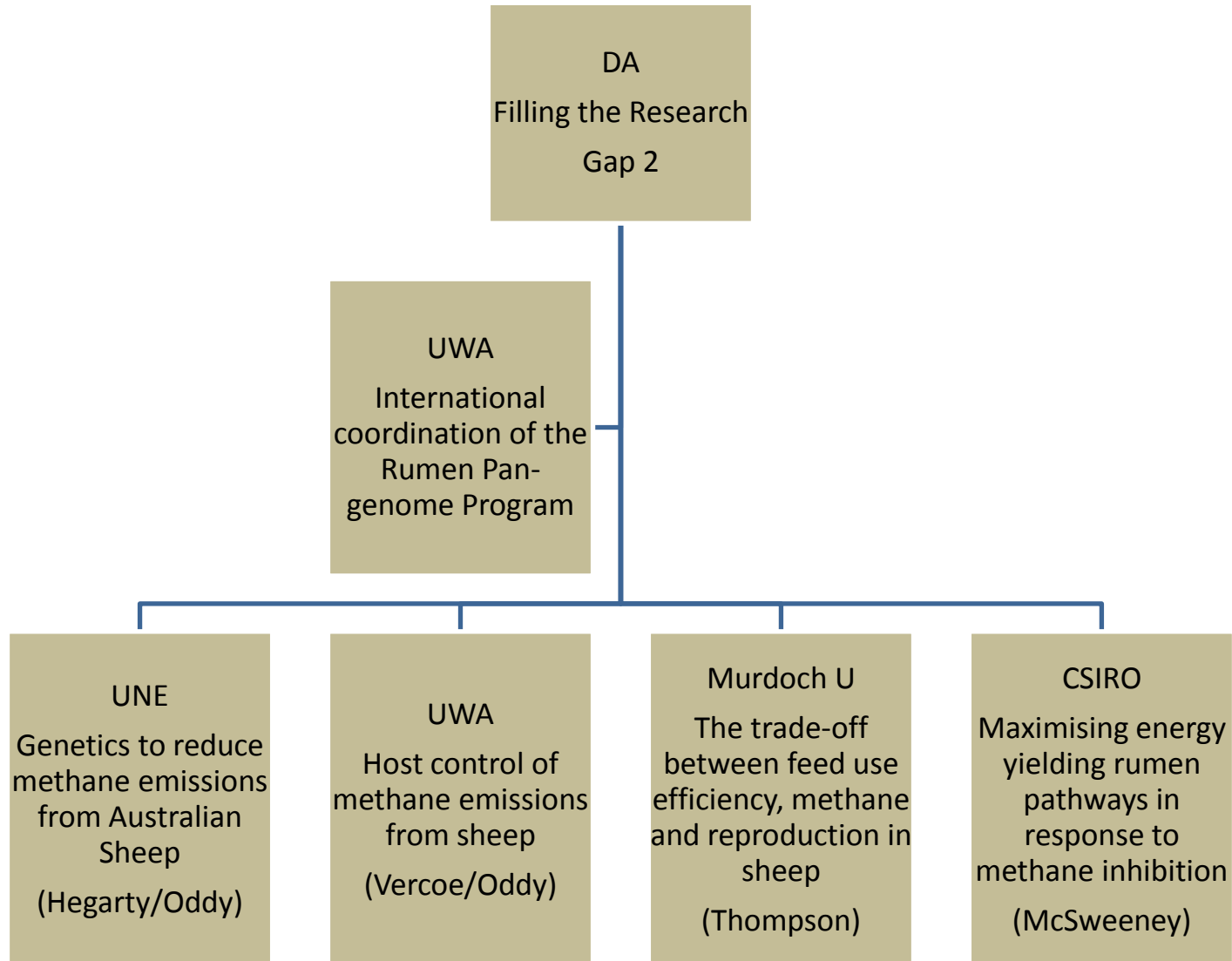
Maybe we should be thinking more along the lines of

$$\text{Animal } P = G_{\text{Pan}} + E_{\text{pan}}$$

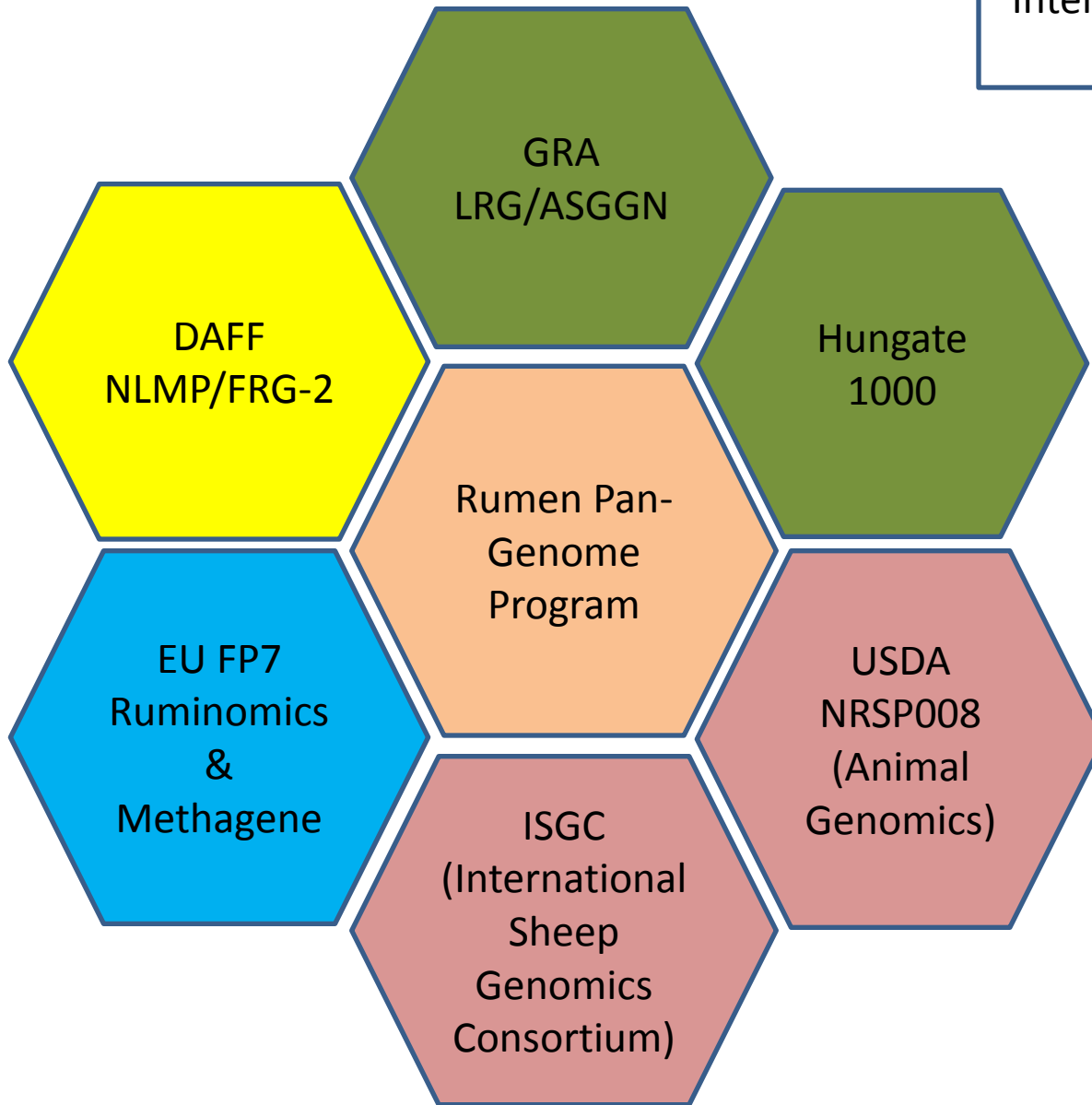
What are we missing out on?



Rumen Pangenome Program



International position of
RPP



A coordinated multidisciplinary programme designed to:

- Develop greater understanding of the 'pangenome' of ruminants and their microbes
- Identify 'pangenomic' factors affecting the breeding and management of ruminants to lower methane and improve production
- Link to other global initiatives to better understand host/microbe interactions

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