Ability to digest explains part of between cows feed efficiency variability

A. Fischer, R. Delagarde, L. Denouel & P. Faverdin

More/equal production with less inputs... How ?

Improving feed efficiency

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Understanding underlying biological mechanisms involved in between cows feed efficiency differences

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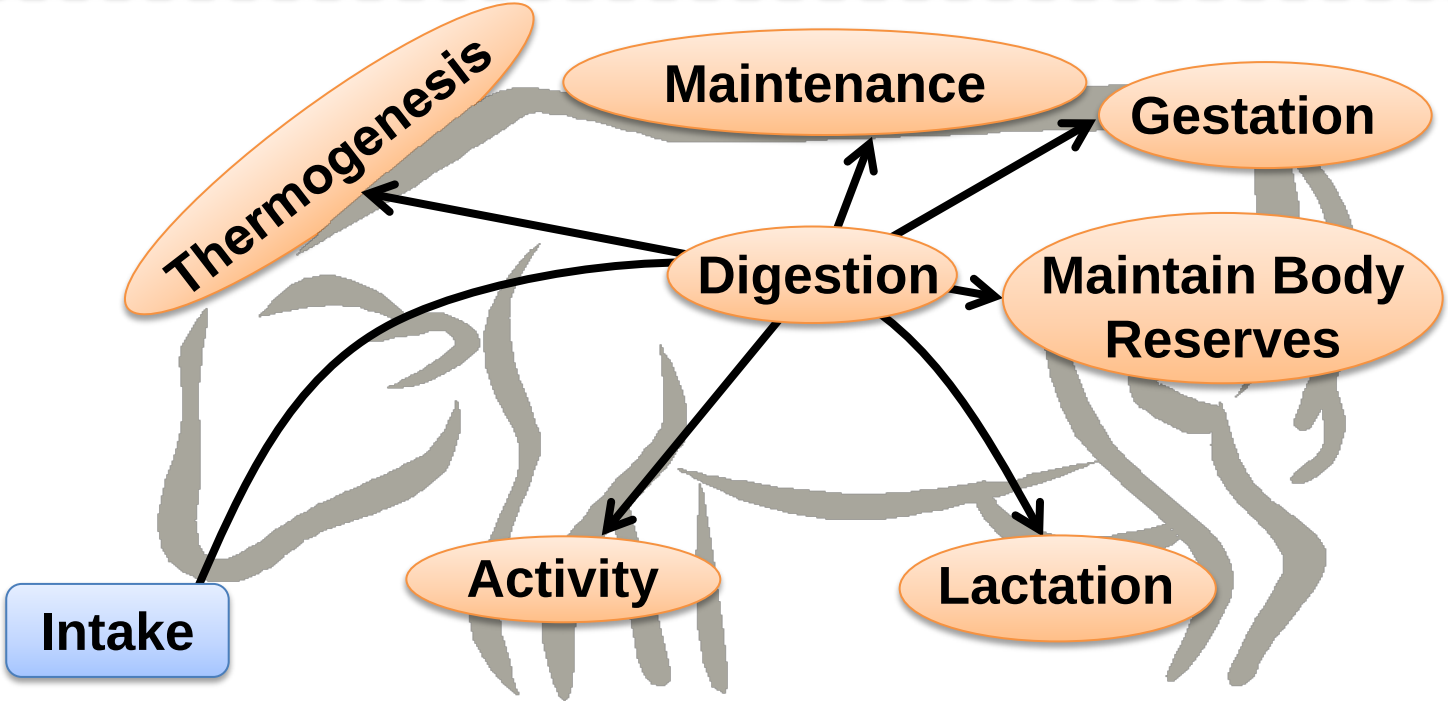

Asked Questions…

Why do **inefficient (efficient) cows** need to **eat more (less)** than the efficient ones, for **similar energy requirements**?

Hypothesis:

Within same diet*, cows are inefficient (efficient) because they digest less (more)*

➔ *inefficients (efficients) need to eat more (less) for similar energy requirements*

Objective

Are between cows feed efficiency differences determined by digestibility differences?

- **Methodology:**
  - Assessing individual DM digestibility
  - Assessing feed efficiency with REI
- **Results: explaining REI with DM digestibility?**
- **Conclusion**

Assessing DM digestibility

Dry Matter Digestibility (DMd) = GP #qwdnh#

Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Yb distribution														
Faecal sampling														

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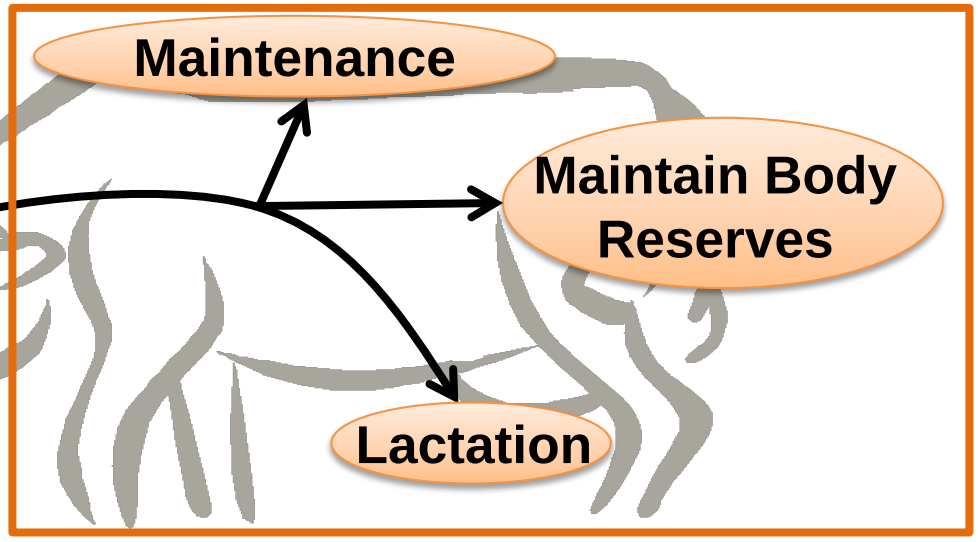
Measuring feed efficiency



Intake

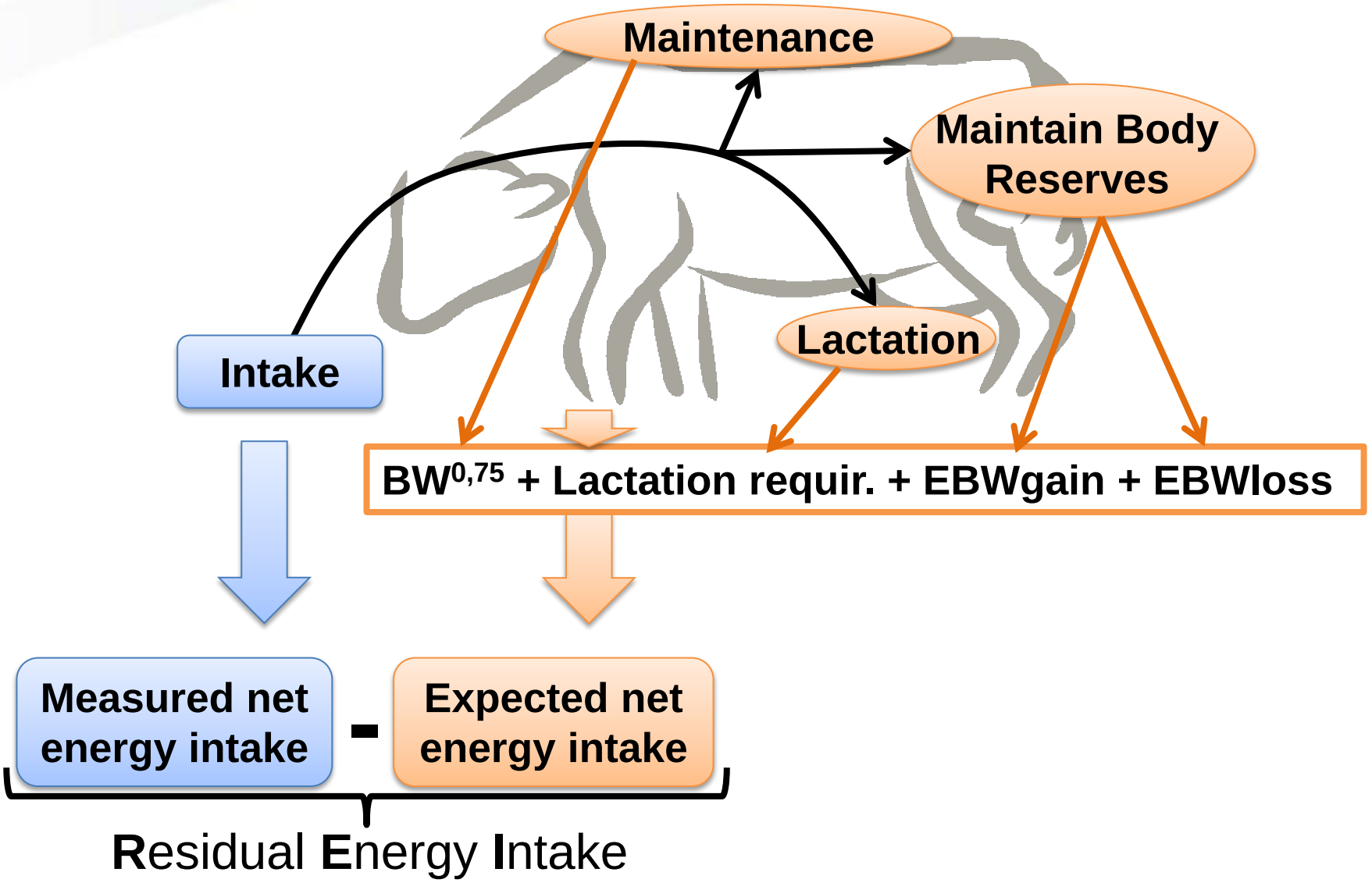
Measured net energy intake - Expected net energy intake

Residual Energy Intake

Positive Difference
➔ Cow **eats more** than expected
= **less efficient** than expected

Negative difference
➔ Cow **eats less** than expected
= **more efficient** than expected

Measuring feed efficiency



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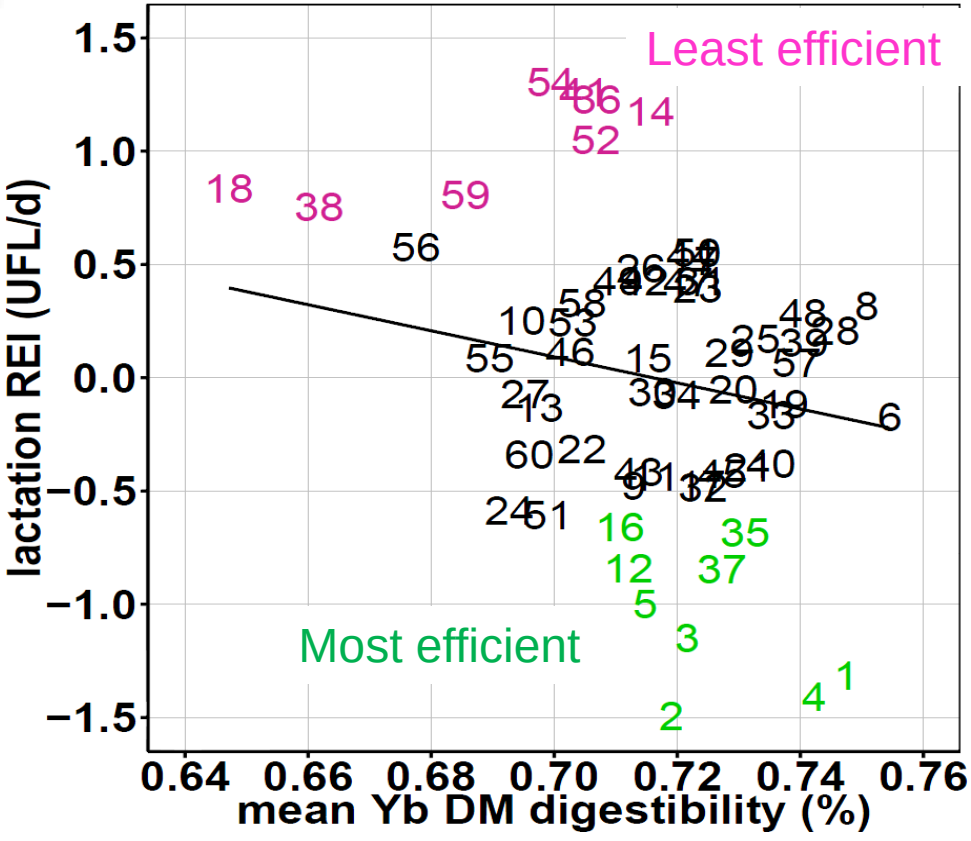


Relevant with literature:
0.12 *for*
Nkrumah et al. (2006)
McDonnell et al. (2016)

$R^2 = 0.12$

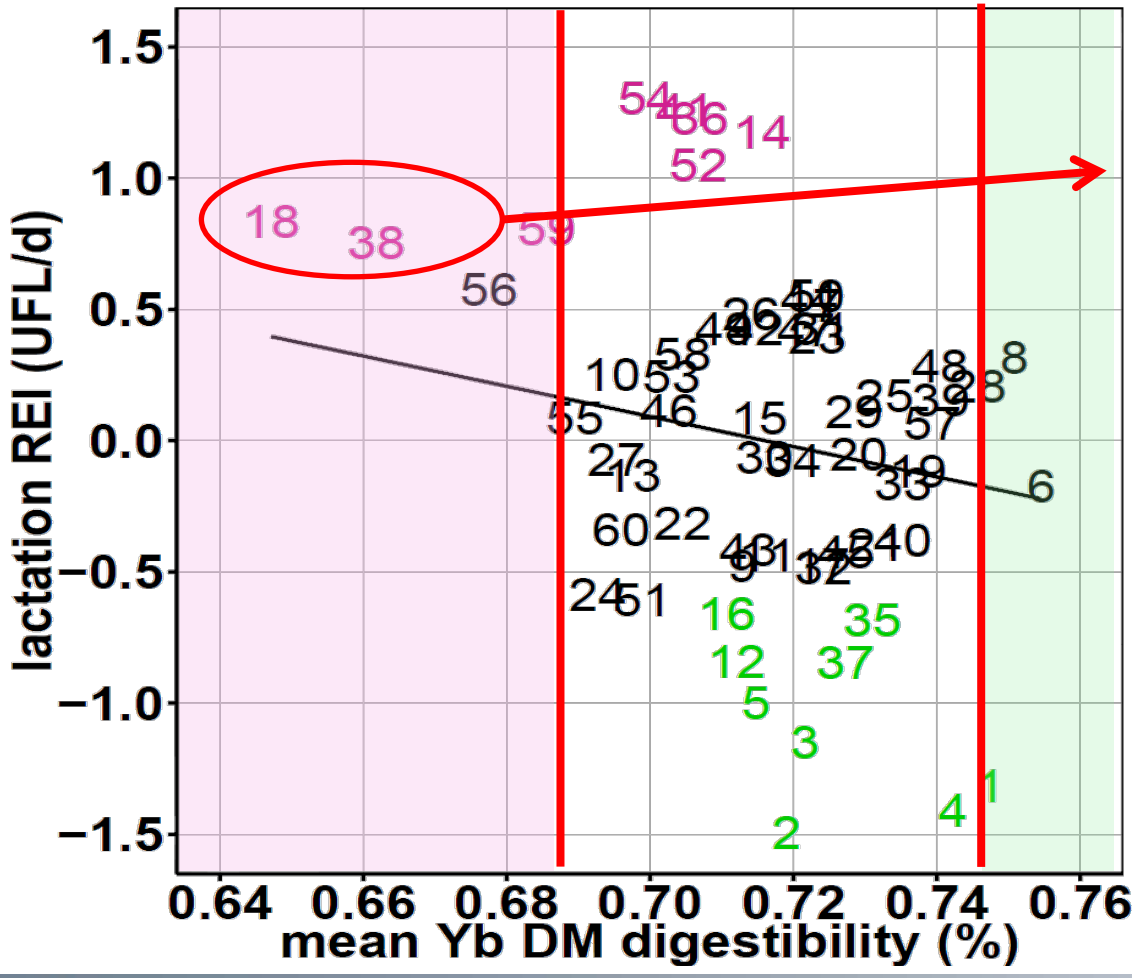
RSE = 0.62

<u>Method NOT accurate enough</u> to assess real between cows DMd differences !

Results: explaining REI with DMdigestibility ?

Identification

6 % lowest digestibility (=4/60) 6 % highest (=4/60)



3 cows probably **inefficient** because **low DM digestibility**

REI group
a medium
a the_least_efficient
a the_most_efficient

Results: explaining REI with DMdigestibility ?

Lower digestion because of too high intake level ?

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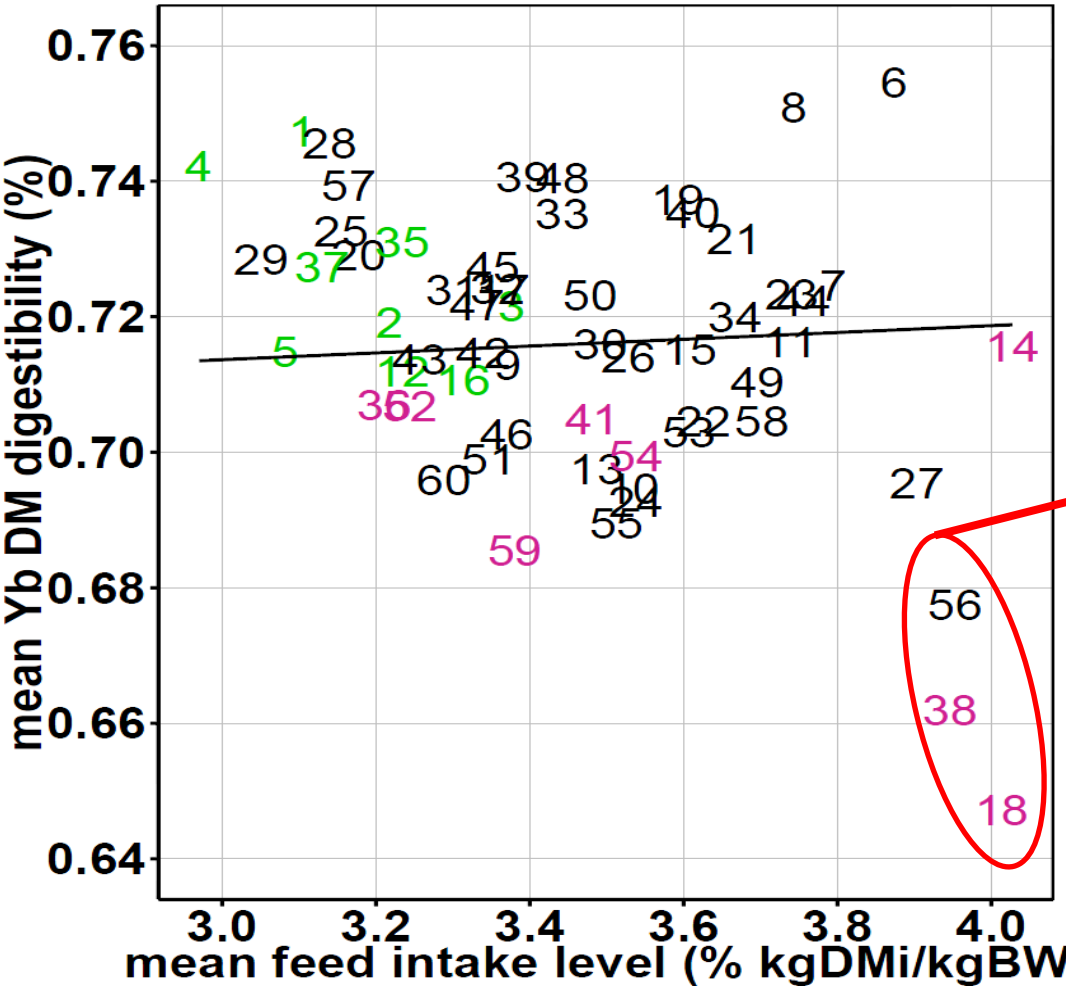

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3 cows with low DMd
+ high intake level

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- **Difficulty to measure** accurately **between cows DMd** differences **for numerous cows**

  ➔ **potential to combine several methods (NIRs, Yb): need for a huge calibration database**

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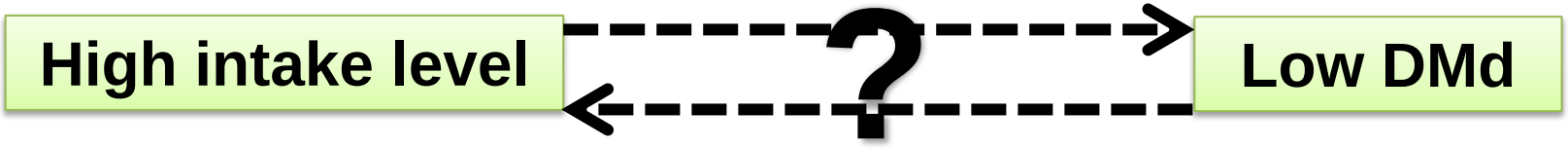

Coming soon:

Effect of imposed intake level on feed efficiency?

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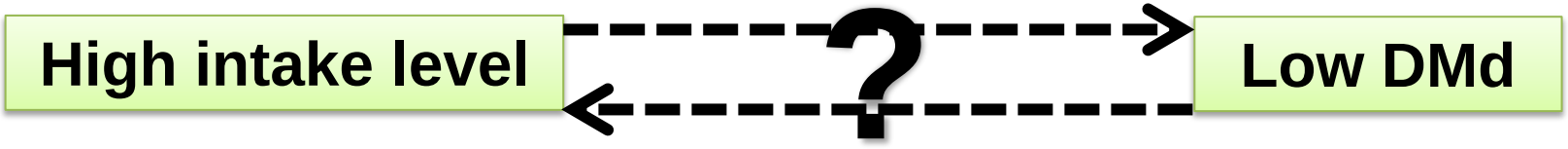

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