

United we stand ... Divided we fall

Chemical communication in *E. coli* O157:H7

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IMPACT (IMPROVED PATHOGEN CONTROL TECHNOLOGIES)



GLOBAL AIM:

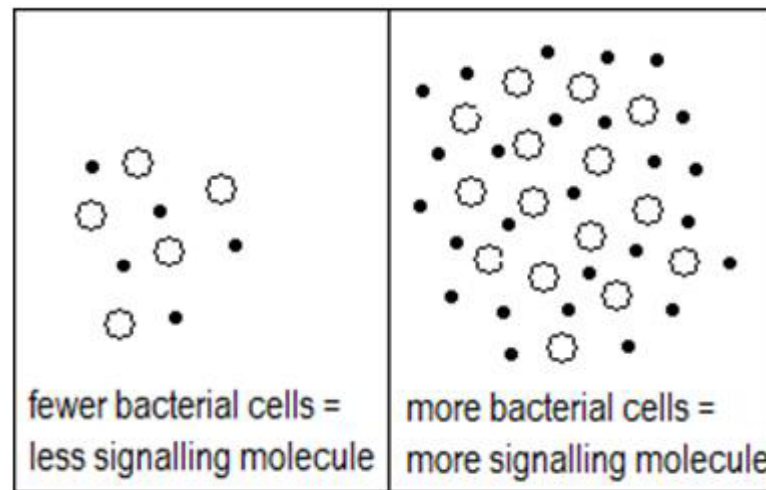
To develop a **biocontrol** strategy that can be used by the New Zealand meat industry to **reduce** the numbers of *E. coli* O157:H7 on meat products

THIS PROJECT:

To investigate the effect of **Quorum Sensing** on the behaviour of *E. coli* O157:H7, to determine if it could be used as a **mitigation strategy**

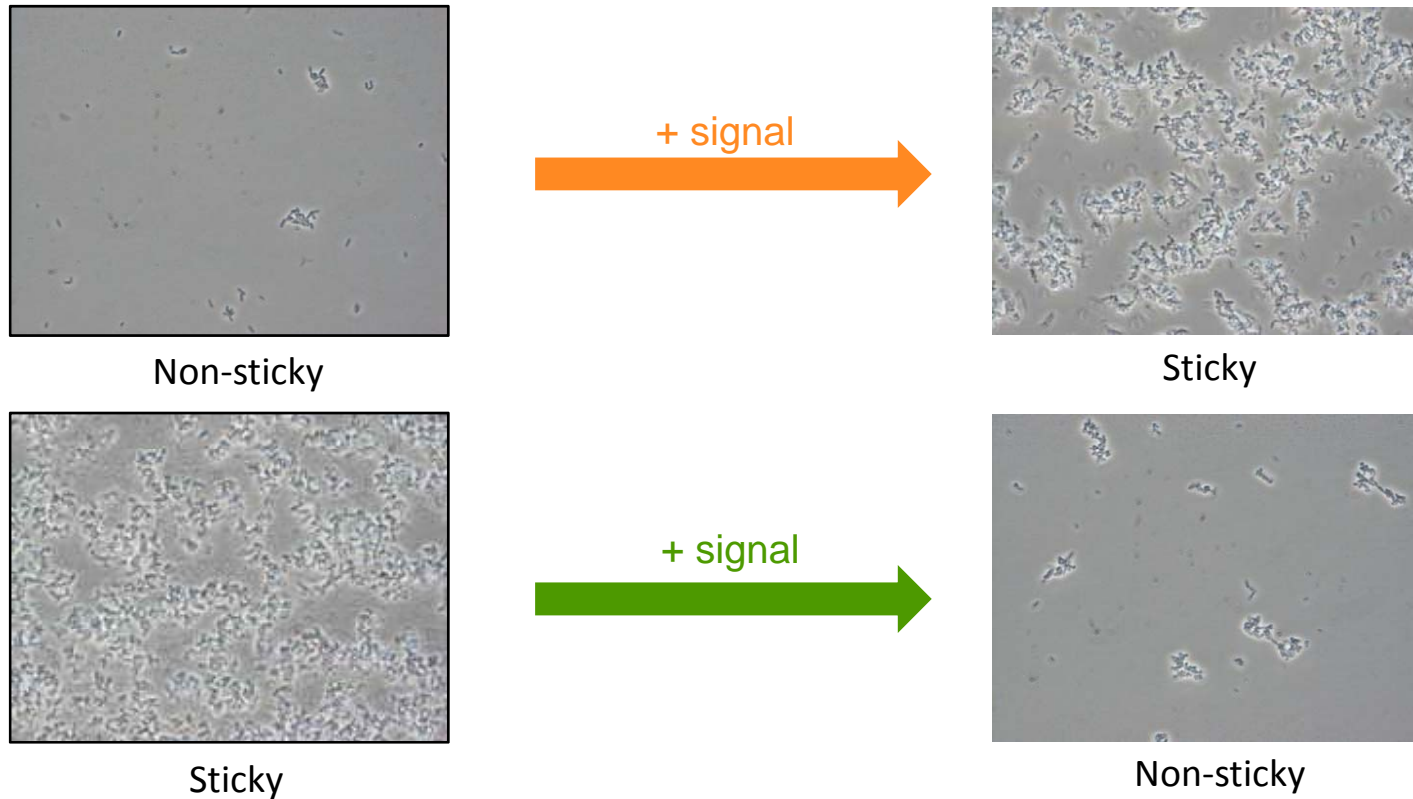
Quorum Sensing

Cells communicate by producing and detecting signalling molecules, co-ordinating behaviour in a density-dependent manner



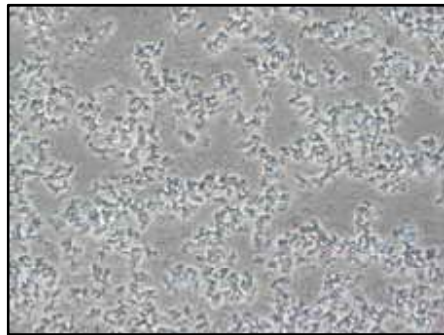
Once a certain population threshold is reached a change occurs within the cell providing opportunities for adaptation to the host environment

E. coli stick together using components on the cell surface

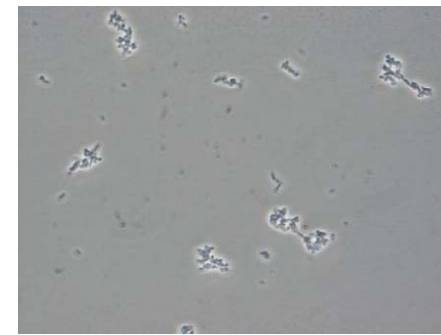


Adding different signals reverses this ability to stick together

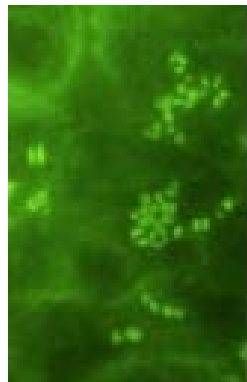
If we alter how bacteria stick together, can we alter attachment?



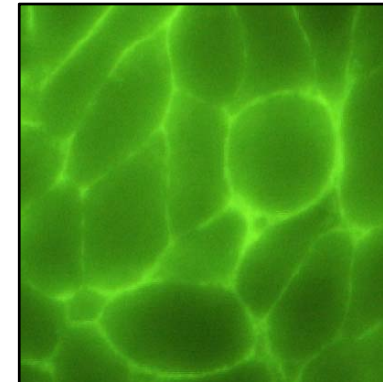
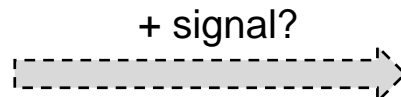
Sticky



Non-sticky

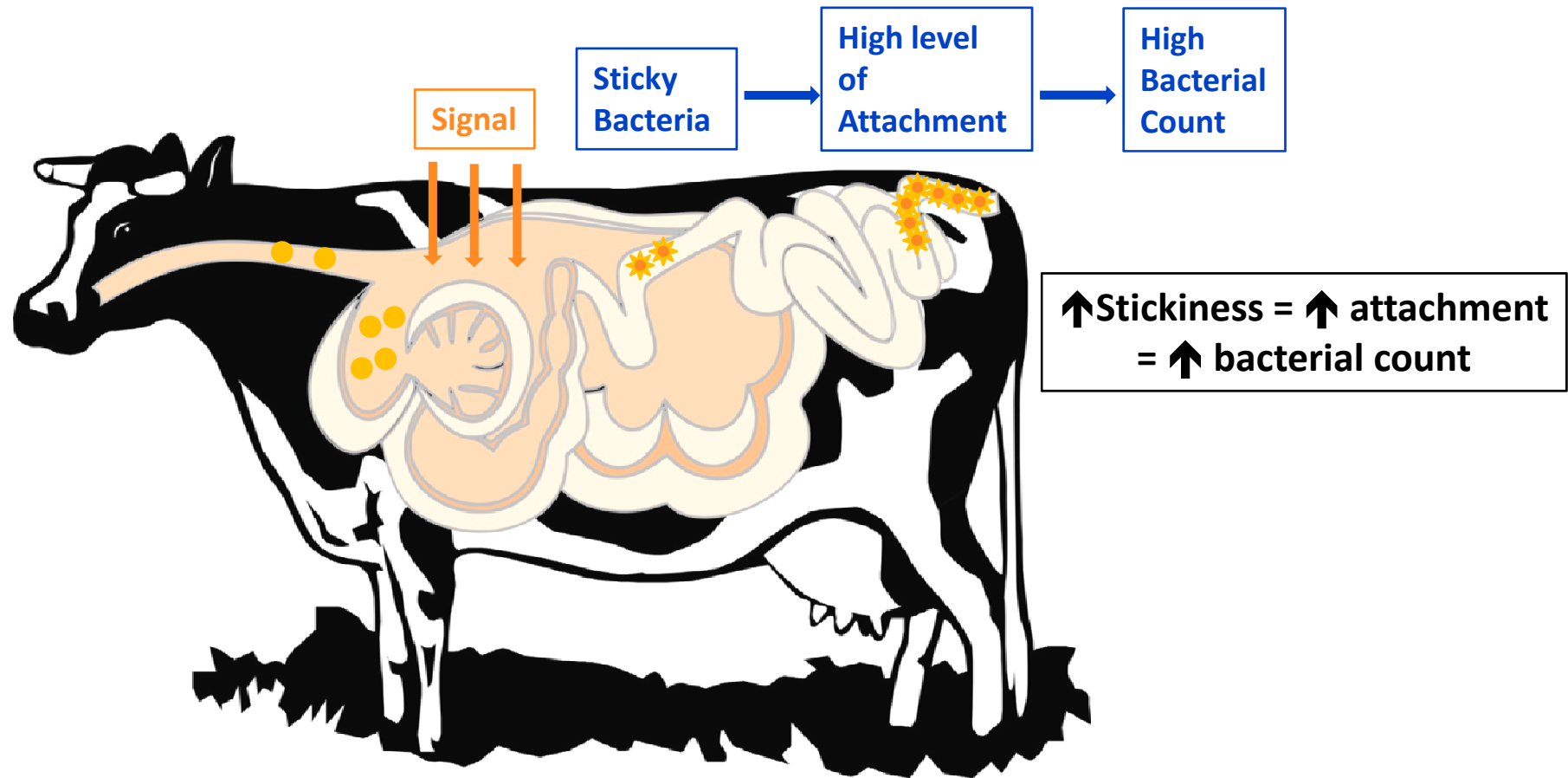


High level of attachment

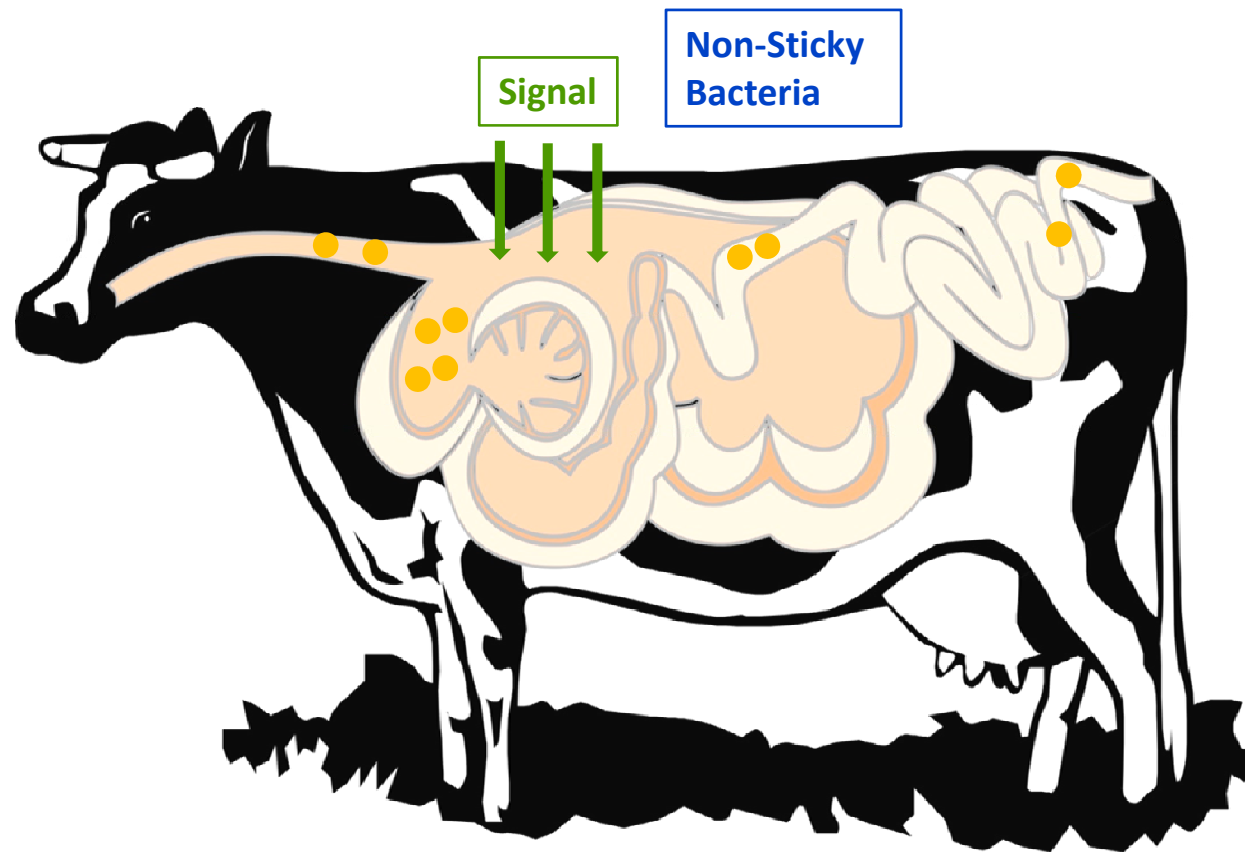


Low level of attachment

Can chemical signalling affect the bacterial count?



Can chemical signalling affect the bacterial count?



Summary

- § Specific signalling molecules alters how *E. coli* O157:H7 stick together
- § If we change the stickiness of *E. coli* O157:H7 can we alter attachment to the epithelia?
- § ↓ attachment = ↓ bacterial count
- § Quorum sensing could potentially be used as a biocontrol on farm or at processing

