# Automation in livestock and meat industries

Opportunities for automation in beef feedlot induction

At any one time 2% of Australia's cattle are located in feedlots, which are managed facilities where animals are provided a balanced diet to meet market requirements.

All cattle arriving at a feedlot undergo 'induction' where a team of feedlot staff perform physical tasks like ear tagging, vaccinations and tail trimming, which takes 20-30 seconds per animal, in shifts of 3 to 10 hours per day.

Automation potentially provides enhanced animal and worker safety, as well as cost-benefit associated with individualising induction according to each animal's requirements.
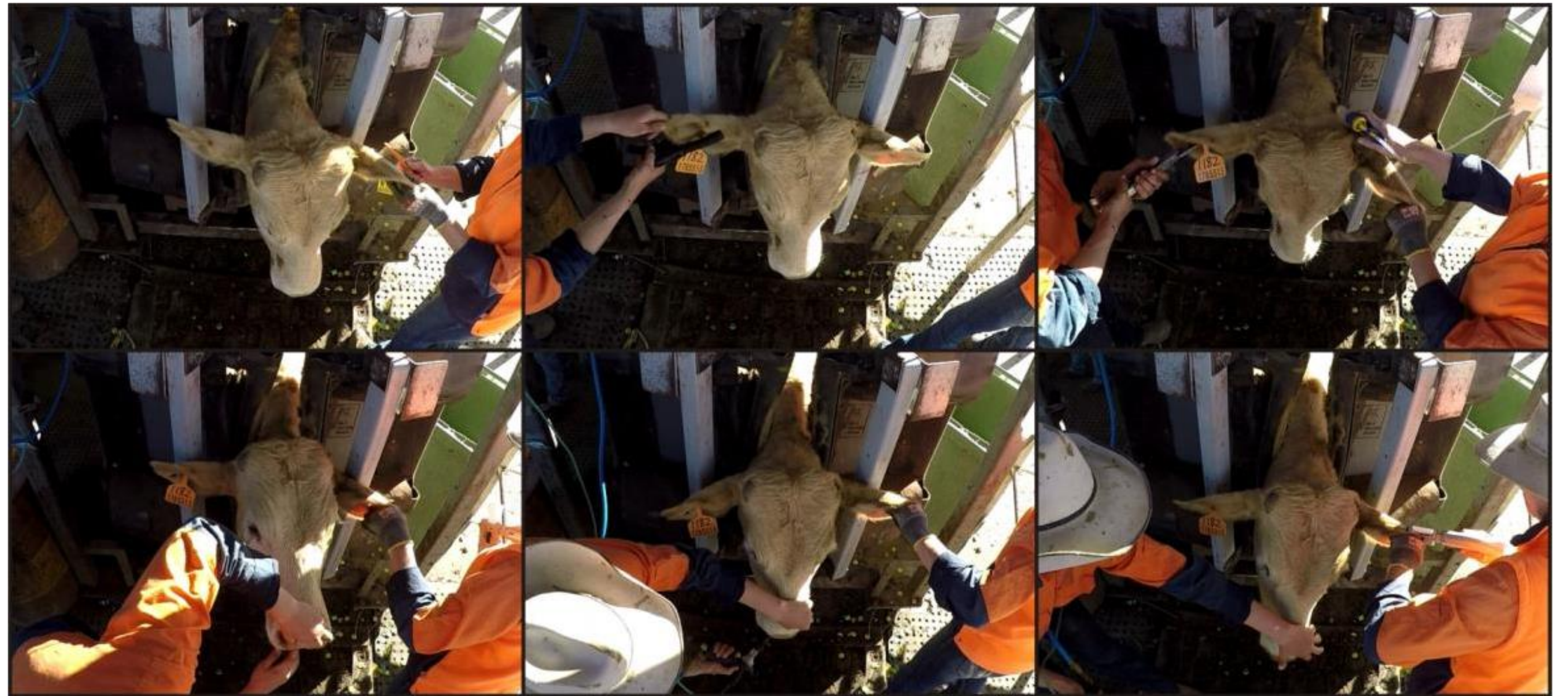
| Feedlot number	Total number of induction:				Average time (s)		Average % time spent with:				Labour units waiting
	Staff	Tasks	Job actions	Job actions per staff	Induct one animal	One job action	Staff holding tool	Staff reaching for tool	Staff waiting	Crush empty	
1	5	11	20	4	30.2	6.1	50	14	21	15	1
2	3	6	9	3	16.9	8.7	43	30	0	27	0
3	3	7	9	3	33.8	7.0	28	9	35	28	1
4	3	9	10	3	19.7	6.3	50	15	12	23	0
5	3	6	11	4	18.9	6.6	33	18	21	28	1
6	4	7	14	4	17.9	4.6	25	12	39	24	2
7	3	8	14	5	21.5	5.9	37	13	26	24	1
Average	3	7	12	4	23.0 s	6.5 s	38%	16%	22%	24%	1
Min	3	6	9	3	16.9 s	4.6 s	25%	9%	0%	15%	0
Max	5	11	20	5	33.8 s	8.7 s	50%	30%	39%	28%	2

Detection of chicken welfare with machine vision

Heat stress is a key contributor to reduced yield in chickens, and negatively impacts the health and welfare of the animals affected.

Broiler / meat chicken sheds would benefit from the development of monitoring systems that provide remote notification in the event of undesirable welfare conditions.

Machine vision systems for commercial conditions are being developed to:

- monitor flock activity
- detect particular bird behaviours
- estimate bird weight
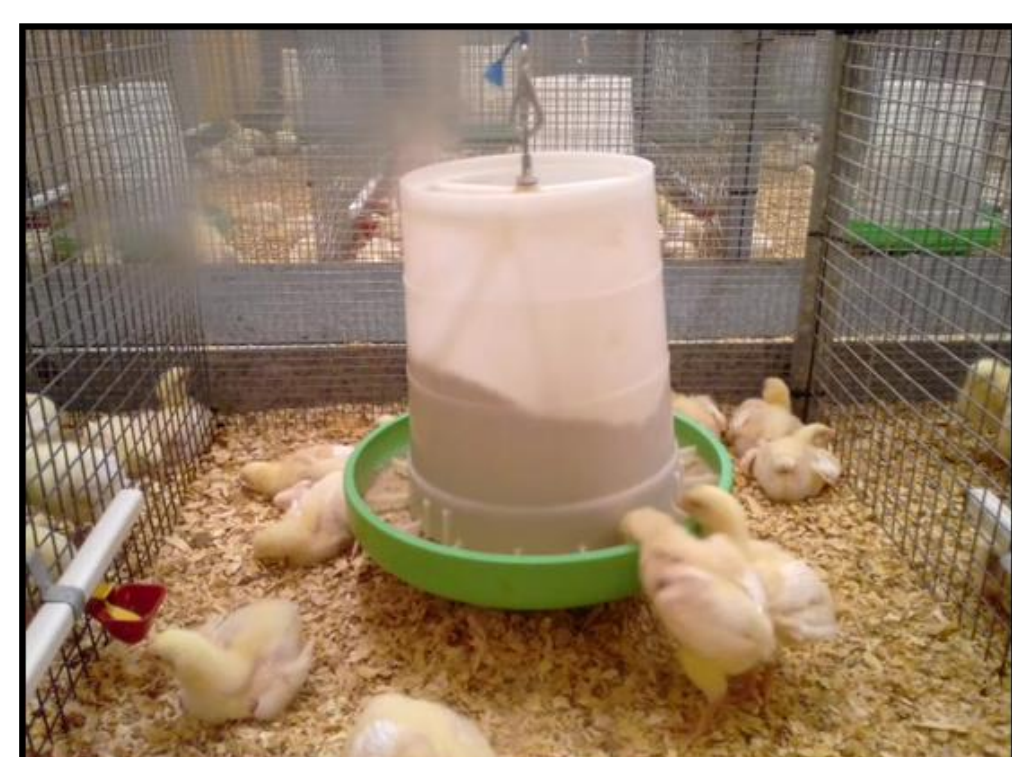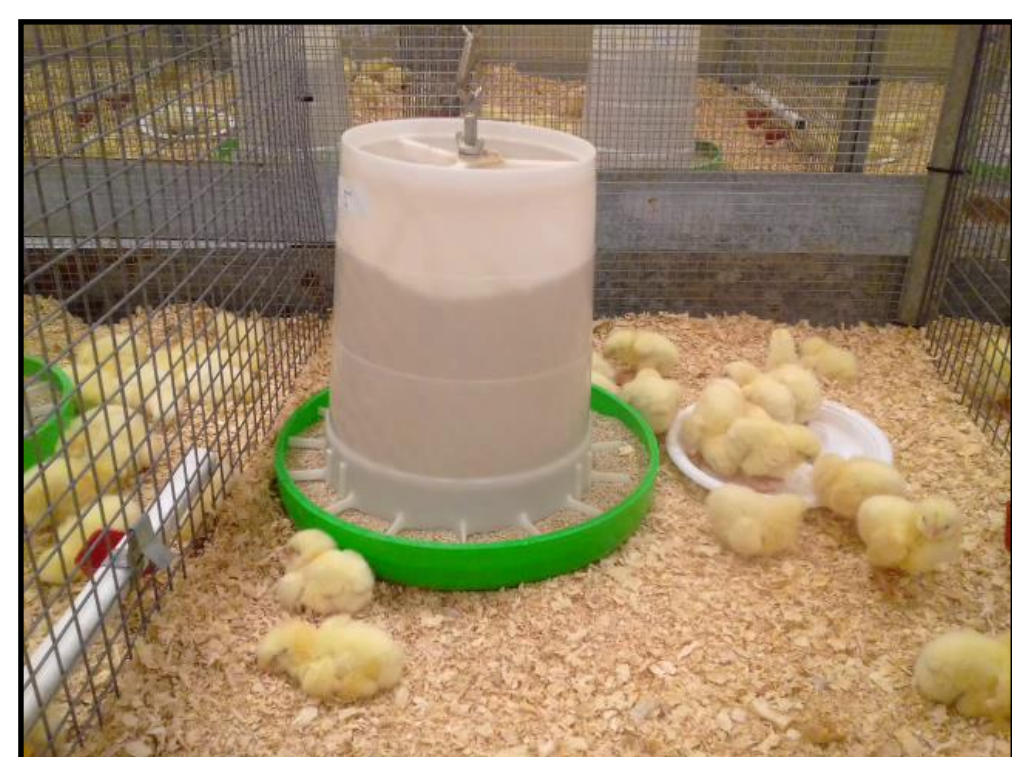
Advanced robotics in meat processing

In food processing our research has a strong focus in automated robotic meat processing with the principal aim on consistent high quality products.

Machine perception is used to discriminate conditions in real-time such that robotic devices can respond within a 'Skilful' context to produce outcomes with great consistency.

Dr Cheryl McCarthy, cheryl.mccarthy@usq.edu.au
Prof. Peter Brett, peter.brett@usq.edu.au