

# Understanding Teacher Perceptions of the Red Meat Processing Sector and Implications for Inclusion in School Activities

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## Abstract

Primary and secondary school students are the next generation workforce, however for them to choose the red meat processing sector as an employer, they must have a positive perception of the sector, and knowledge of the diverse career opportunities available. Teachers and parents are known key influencers of student career pathways, with teachers also determining the content included in teaching programs to meet curriculum outcomes. The aim of this project was to identify teachers' current perceptions of the red meat processing industry and how content is incorporated into teaching. A national teacher survey on knowledge and perceptions of the red meat processing sector was developed and then completed by 97 teachers across Australia. The results identified that a connection with either people working in the sector or the presence and involvement of an abattoir in their local community significantly improved the perceptions of the sector compared to having no connection. There was also a significant relationship between teachers' perceptions of the red meat processing sector and how they felt about careers in this sector. Secondary teachers who possessed an agricultural qualification and taught agriculture, STEM or Primary Industry subjects more broadly had more positive perceptions of the careers associated with the sector than their colleagues. However, there was a general lack of knowledge of what a career looks like in this sector, even by agriculture teachers. These findings provide an evidence base to draw upon for future development of a strategy to attract and retain a talented, diverse, and dedicated workforce in the red meat processing sector.

## Introduction

The Australian red meat processing sector employs 39,561 people (Australian Meat Processor Corporation [AMPC], 2025a), many in regional areas, and is a key contributor to the Australian economy with exports valued at \$10.3 billion (AMPC, 2024b). The red meat processing (RMP) sector consists of transporting, slaughtering, processing and packaging meat for domestic consumption and export markets (Marjorie et al., 2008). The sector offers a variety of roles and careers, including stock handling, processing, meat inspection, packing and logistics, all of which demand a diverse set of skills, knowledge, training and expertise. However, attracting people to work in this sector can be challenging. There is a concern over the lack of knowledge and positive perceptions of agriculture by primary and secondary school students (Manning et al., 2024; Cosby et al., 2022a; Graham, 2021). This is combined with teacher and student general lack of knowledge and awareness of careers associated with the agriculture supply chain (Cosby et al., 2019; Cosby et al., 2022b). Primary and secondary school students represent the next generation workforce, and for them to consider the RMP sector as an employer, having positive perceptions, and knowledge of the diverse career opportunities available to them is key. Misconceptions that the RMP sector

consists of only ‘dirty’ and unskilled work and a general negative stigma are common (Marjorie et al., 2008; National Centre for Vocational Education Research, 2010, Sebastian, 2021), having an influence on public perceptions and support of the sector. Teachers and parents are known key influencers in directing and exposing students to careers and career pathways and whether they will continue further study pathways (Autenrieth et al., 2017; Knowles et al., 2018). Moreover, teachers have influence and control over the content and industries included in teaching and learning programs to meet curriculum outcomes. Therefore, teachers’ current perceptions and knowledge have influence over if they see value to integrate RMP into the curriculum. Previous research directed at upskilling teachers in STEM, agriculture and digital technology, increased the teacher’s interest in participation and integration of learning resources and agricultural concepts into lessons (Cosby et al., 2019). Integration of these resources improved students’ awareness of opportunities for future careers and skills relevant to the agricultural industry (Cosby et al., 2019; Cosby et al., 2022a). Inclusion of agricultural industries and career pathways into teaching programs can also increase the likelihood of students considering further tertiary education (Cosby et al., 2022b; Cosby et al. 2024). The teaching program in Cosby et al., (2022b) provides an example strategy to improve the perception and support of other sectors such as the RMP sector. Similar success has been seen for improving public perceptions, knowledge and awareness through initiatives by the Australian Meat Processor Corporation, the research and development corporation for the RMP sector. One example is the ‘More to Meat’ campaign through strategic advertisements to increase public support of the importance this sector has to communities and the national economy (AMPC, 2024c). Improving knowledge and awareness of agriculture for current and future consumers is vital to improve perceptions (Cosby et al., 2023a; Settle et al., 2017).

Therefore, the aim of this project was to understand teacher knowledge and perceptions of the RMP sector and associated career pathways, to identify how the sector is being introduced, discussed and taught to students. These findings will inform the development of a strategy to improve the perception, knowledge and awareness of the RMP sector for both teachers and students, with the aim to attract and retain a talented, diverse, and dedicated future workforce. The research questions examined were:

- 1) Are Australian teachers connected to the RMP sector?
- 2) Do Australian teachers perceive the RMP sector positively?
- 3) How do these connections and perceptions impact their understanding of career pathways?
- 4) How do these connections and perceptions impact teaching of the RMP sector in the classroom?

## **Methodology**

A national teacher survey was developed based on the results of semi-structured interviews with teachers and parents found in Manning et al. (2022b). Primary and Secondary teachers across Australia were invited to participate in the online Qualtrics survey. The survey was distributed through direct targeting to teacher associations and advertised on social media (Facebook). Participation was voluntary and data collection, including individual and school details, were kept anonymous. The survey consisted of twenty-five questions, with the first question seeking consent to participate in the survey and associated research. The remaining questions included seventeen closed-ended questions and seven open-ended questions (**Appendix A**). General demographic data was collected for the participant (e.g., Gender, level of education) and school

(e.g., location, subjects taught) outlined in **Appendix A**. In addition, information regarding teachers' level of connection and perceptions of the RMP sector was collected. There was a total of 167 survey responses, with 24 ineligible responses removed (not a teacher) and a further 46 incomplete submissions. The remaining 97 responses were processed and analysed using R Studio program (R Core Team, 2021). Due to the small sample size, data processing involved merging responses into response categories and converting the five-point Likert scale response (strongly disagree, disagree, neutral, agree, strongly agree) to one of two three-point scales (disagree, neutral, agree OR positive, neutral, negative) as per Manning et al. (2022b). For the question that required participants to list careers they associate with the RMP sector, responses were grouped based on job similarities and work characteristics, resulting in 27 classifications (**Appendix B**). Descriptive statistics were completed for demographics and Fishers Exact tests for interactions between pairwise combinations of survey questions were performed. If a significant interaction ( $P \leq 0.05$ ) was found, a contingency table was developed to explore the interactions further. The Fishers Exact test was selected due to low response numbers across categories. All research protocols and instruments were approved by the CQUniversity Human Research Ethics Committee (approval number 23414).

## Results and discussion

### Teacher Demographics

The majority of the ninety-seven teachers taught in secondary schools (77.3%,  $n=75$ ), followed by primary schools (16.5%,  $n=16$ ) and then a smaller percentage taught across both levels (6.2%,  $n=6$ ). Teachers taught across an array of subject areas with the top three being Agriculture (53.6%), STEM (Science, Engineering, Technology and Mathematics 43.3%) and Primary Industries (17.5%). Other subjects (56.7%) included home economics, Vocational Education and Training (VET), Studies of Society and Environment (SOSE) and humanities, health and physical education, religion, business, arts, history, life skills and other learning or career-based subjects. Some teachers identified as teaching across multiple subjects, hence the total of the percentages exceeds 100.

All teachers held a formal qualification: either a Postgraduate Degree (49.5%), Bachelor's Degree (47.4%) or a diploma or certificate from VET (3.1%). Only around a third (38.1%,  $n=37$ ) held a qualification in agriculture. Out of 52 teachers who reported teaching at a school offering agriculture, 35 (67.3%) taught agriculture with an agriculture related qualification, while 17 (32.7%) taught the subject without an agricultural related qualification. Out-of-field teaching is commonplace in Australian secondary schools (Weldon, 2016), which has implications for the quality of education provided to students. Research has found that the qualification held by the teacher and knowledge of the subject can influence students' achievements (Kola & Sunday, 2015) and can hinder student awareness of careers (Awal, Christie, Watson & Hannadige, 2012).

The mean reported age was 45.1 years (SD 10.2 years) and 87% of participants identified as female. These results align with 2019 Australian Bureau of Statistics (2019) that reported 72% of registered teachers identified as female. Participants of all levels of experience participated in the survey including those with less than one year's experience (2.1%,  $n=2$ ), 1 – 5 years (6.2%,  $n=6$ ), 5 – 10 years (14.4%,  $n=14$ ), 10 – 15 years (20.6%,  $n=20$ ), 15 – 20 years (24.7%,  $n=24$ ) and more

than 20 years of teaching experience (32.0%, n=31). The breakdown of teaching experience was comparable to findings from Australian studies involving Cosby, McDonald, Fogarty, Sullivan, Kelly & Manning (2023b) and Billett, Turner & Li (2023) with the majority of teachers surveyed having 20 or more years of experience (n = 91, 47%) There were significantly smaller numbers of teachers that participated in this study compared to Cosby et al., (2023b) and Billett et al., (2023) with 195 and 532 respectively. Nevertheless, the results share similarities with the tendency of more experienced teachers in the field compared to early career teachers, highlighting the national teacher shortage and challenge to attract new entrants to the profession (Australian Teacher Workforce Data, 2024), however it could also be a result of how the survey was distributed.

### **Teacher location demographics**

Teachers were predominantly located across Queensland (50.5%, n=51) and New South Wales (32.0%, n=32), with a comparatively smaller proportion residing in Victoria (8.2%, n=8), South Australia (4.1%, n=4), Tasmania (3.1%, n=3), Western Australia (1.0%, n=1), and the Northern Territory (1.0%, n=1). The teachers taught in schools within rural towns (27.8%), major cities (22.7%), small towns (16.5%), large towns (15.5%) or capital cities (14.4%). Three teachers were unsure of their school location (3.1%). Of the teachers who participated, 63 of them taught in a school that offered agriculture as a subject (64.9%). These results are comparable to a study by Cosby et al (2023b), surveying NSW teachers, that reported 80% (n=152) of schools offered agriculture. The survey did not collect any personal identifiers such as school name, therefore intra-school comparisons were not possible.

### **Teacher connectedness and overall perception of the red meat processing sector**

A total of 29 (29.9%) teachers felt they were connected to the RMP industry (visited an abattoir), 24 (24.7%) teachers felt they were strongly connected (friend or family in sector), 27 (27.8%) felt they were not connected and 17 (17.5%) reported a distant connection. Regarding, if teachers had an overall positive perception of the RMP sector, 71 (73.2%) teachers agreed they did, 20 (20.6%) were neutral and 6 (6.2%) disagreed with having a positive perception of the sector. The location of the teacher only had a significant effect on teacher level of connectedness ( $P < 0.01$ ). Teachers located in a capital city (250,000+ people) were more likely to feel disconnected to industry (71.4%, n=10). Teachers in a major city (50,000-250,000) reported both a connection (40.9%, n=9) and no connection (31.8%, n=7) to industry. Half of the teachers in a large town (19,000-49,000) reported having a connection to industry (53.3%, n=8) followed by no connection (26.7%, n=4). Teachers located in a town (5,000-18,000 people) and rural town (5,000-18,000 people) reported either having a strong connection to industry (37.5%, n= 6, and 44.4%, n=12 respectively) or a connection (25.0%, n=4, and 25.9%, n=7 respectively) (data not shown). The impact of location is not unexpected, due to location restrictions of processing plants to livestock in conjunction with the positive impact local abattoirs have in smaller towns and rural areas through employment and income opportunities.

There was a significant difference on feelings of connectedness ( $P = 0.02$ ) and overall perception ( $P = 0.02$ ) of the RMP sector between teachers who held an agricultural qualification and those who did not. Interestingly, teachers who held a qualification in agriculture reported having a connection to industry (and visited an abattoir before) (75.9%, n=22) and had increased level of

agreement with having an overall positive perception of the sector (46.5%, n=33). In contrast, teachers that did not have a qualification in agriculture were more likely to report having no connection to industry (96.3%, n=26) but still had an overall positive perception of the sector (53.5%, n=38). Furthermore, secondary teachers who taught Agriculture, STEM and/or Primary industries were significantly ( $P = 0.01$ ) more positive (81.8%, n=54) of the RMP sector than colleagues who taught other subjects (54.0%, n=17). Similarly, subject matter influenced how teachers felt connected to industry ( $P < 0.001$ ). Those who taught agriculture reported having a connection to industry and had visited an abattoir before (42.4%, n=28) and a strong connection with a friend or family working in the sector (27.3%, n=18), compared with half of the teachers who taught other subjects feeling disconnected (54.8%, n=17) or having a distant connection and knowledge of an abattoir in local area (22.6%, n=7).

Analysis of teacher connection and perceptions of the RMP sector found a significant relationship ( $P < 0.001$ ). Teachers who reported having a positive perception of the sector, had a stronger connection to RMP sector, followed by distant connections as seen in **Table 1**. Over half of the teachers who identified having any type of connection (strong, connection and distant) with the RMP sector agreed that their perception was positive (88.6%, n=62), followed by neutral (10.0%, n=7), with only one disagreeing (1.4%). In comparison, teachers who identified as having no connection to the RMP sector were more likely to report a neutral response (48.1%, n=13), followed by agreement of a positive perception (33.3%, n=9) and five disagreeing (18.5%). Improved knowledge and awareness in agriculture have been identified as important, as a lack of awareness plays a role in an individual's ability to make informed decisions (Cosby et al., 2023a; Settle et al., 2017). This lack of awareness and knowledge could have influenced the neutral and disagreed responses towards teacher perceptions of the RMP sector, evident for those who felt they had no connection to industry. Negative associations of the sector can also influence how the sector is perceived; in the US, exposure to those involved in the processing of food helped undergraduate students appreciate the importance of the sector and the workers, however, students still had reservations based on their perceptions of the sector consisting of 'dirty work' (Yamashita 2017). The stigma associated around abattoir work can also impact on the willingness of young people to consider careers in the RMP sector (Marjorie et al., 2008).

**Table 1. Association between connection to the red meat processing sector and a positive perception of the red meat processing sector. Values represent frequency of responses for every combination of categorical variables (n=97).**

		<i>Overall perception of the red meat processing sector is positive</i>			
		Agree	Neutral	Disagree	P-value
<i>Connection to the red meat processing sector</i>	I'm strongly connected to the industry with a friend or family member working in the sector	24	0	0	<0.001
	I'm connected to the industry and have visited an abattoir before	25	3	1	
	I have a distant connection and know of an abattoir in my local area	13	4	0	
	I don't feel connected to the industry	9	13	5	

**Teacher perceptions of four positively framed statements of the red meat processing sector**

Four positively framed statements (as seen in **Appendix A Q21**) were provided for teachers to select their level of agreement. The first statement, '*The red meat processing sector is an important contributor to the social, economic, and environmental sustainability of the local communities*', had the majority of teachers in agreement (87.6%, n=85), compared to 9 who were neutral (9.3%) and 3 (3.1%) who disagreed. The Australian red meat processing sector employs 39,561 people (AMPC, 2025a), with 80% of these jobs located outside of capital cities (Meat & Livestock Australia, 2022), providing secure employment and support for regional and rural communities. The impact this sector has on local communities is highlighted by the majority of participants agreeing (compared to being neutral or disagreeing). The second statement, '*The red meat processing sector is a leader in manufacturing innovations and technology advancement*', had just over half of teachers in agreement (55.7%, n=54) followed by 35 (36.1%) neutral and 8 (8.2%) in disagreement. The third statement, '*I believe the red meat processing sector is proactive about environmental issues*', had less than half of teachers in agreement (47.4% n=46), the same neutral response as seen in statement 2 (36.1%, n= 35) and the largest number of teachers who disagreed (16.5%, n=16). The RMP sector in Australia is active in research to improve and streamline the manufacturing process, the sector also develops and adopts technologies (AMPC, 2024d) that monitor and maintain food quality and freshness (Spada et al., 2024) and to reduce environmental impact (McCabe et al., 2020). Neutral and negative responses to these statements may reflect a lack of awareness of what the sector is doing regarding innovative and technological advancements. A study by Cosby et al., (2023a) evaluating the digital literacy and self-efficacy of Australian technology teachers, found that while teachers had basic digital literacy, they lacked the confidence and ability to conduct more detailed analytics. The current digital literacy and awareness of technology use in agriculture, may have influenced the more neutral and disagreeing stances when applied to the RMP sector's role in digital technology, innovations and addressing environmental issues. The fourth statement, '*Animal welfare is a high priority in the red meat processing sector*', shared a similar distribution to statement 1, with the majority of teachers in agreement (75.3%, n=73), 18 (18.6%) neutral and 6 (6.2%) in disagreement. In Alonso et al. (2020), the level of education of consumers was positively correlated with their moral concerns relating to animal production and their willingness to purchase more welfare friendly products. Cosby et al. (2023a)

found that educating teachers on agricultural technology during a professional development workshop improved teachers' perceptions of the use of technology in agriculture for animal welfare outcomes. These studies highlight that through education initiatives that increase knowledge and awareness, individuals can make more informed decisions that may alter their perceptions of the sector (Hume et al., 2024; Cosby et al., 2023a; Settle et al., 2017).

The association between teachers' overall positive perception of the RMP sector with the four positively framed statements was analysed and a significant relationship was found ( $P < 0.001$ , **Error! Reference source not found.**). Teachers who agreed to having an overall positive perception of the RMP sector were more likely to agree with the four positively framed statements (**Table 2**). Teachers who indicated a neutral response either agreed or selected neutral for the four statements (**Table 2**). In comparison, teachers who disagreed to having an overall positive perception of the sector saw no increased likelihood of disagreeing with the four statements. Overall, the results suggest that the majority of teachers in this study agreed to having an overall positive perception about the RMP sector and were in agreement or neutral with the four positive statements.

**Table 2. Association between perception of the red meat processing sector and response to four positively framed statements about the sector. Values represent frequency of responses for every combination of categorical variables (n=97).**

		<i>Overall perception of the RMP sector is positive</i>			
		Agree	Neutral	Disagree	P-value
<i>The red meat processing sector is an important contributor to the social, economic, and environmental sustainability of the local communities</i>	Agree	68	14	3	<0.001
	Neutral	3	5	1	
	Disagree	3	1	2	
<i>The red meat processing sector is a leader in manufacturing innovations and technology advancement</i>	Agree	50	4	0	<0.001
	Neutral	17	14	4	
	Disagree	4	2	2	
<i>I believe the red meat processing sector is proactive about environmental issues</i>	Agree	44	2	0	<0.001
	Neutral	21	11	3	
	Disagree	6	7	3	
<i>Animal welfare is a high priority in the red meat processing sector</i>	Agree	60	12	1	<0.001
	Neutral	10	4	4	
	Disagree	1	4	1	

### **Teacher connectedness and careers in the red meat processing sector**

Just over half of teachers reported feeling positively towards careers in the RMP sector (52.6%, n= 51), 25 were neutral (25.8%), 21 (21.6%) felt they did not know enough about careers in the

sector and 0 teachers felt negatively. Teacher location was found to have a significant effect on how teachers felt about careers in the sector ( $P=0.01$ ). Teachers located in a capital city (250,000+ people) reported not knowing enough about careers in the sector (50.0%,  $n=7$ ) or had a neutral response (35.7%,  $n=5$ ). Those located in a major city (50,000-250,000 people) reported positively (54.5%,  $n=12$ ) and equally across neutrality and not knowing enough (22.7%,  $n=5$  respectively). Teachers located in a large town (19,000-49,000 people) and town (5,000-18,000 people) reported positively towards careers (53.3%,  $n=8$ , and 50.0%,  $n=8$  respectively) and neutrality (26.7%,  $n=4$ , and 43.8%,  $n=7$  respectively). Those in a rural town reported the highest positive response to careers (74.1%,  $n=20$ ). In addition, the subject matter of teacher qualifications influenced how they felt about careers ( $P=0.01$ ), with those who held an agricultural qualification reporting positively (67.6%,  $n=25$ ) and neutral (24.3%,  $n=9$ ). Comparatively, those who held a qualification in another subject reported positively (43.3%,  $n=26$ ), closely followed by not knowing enough about careers (30.0%,  $n=18$ ). The subject matter taught also had a significant impact on how teachers felt about careers ( $P<0.001$ ). Teachers who taught Agriculture, STEM and/or Primary industries felt more positively (66.7%,  $n=44$ ) and neutral (21.2%,  $n=14$ ), and teachers who taught other subjects felt like they did not know enough (41.9%,  $n=13$ ) or were neutral (35.5%  $n=11$ ) about careers in the RMP sector.

There was a significant effect of connectedness on the perception of careers in the RMP sector ( $P<0.001$ ; **Table 3**). Teachers with a friend or family member working in the industry or those that had visited an abattoir had significantly greater perceptions of careers compared to those with no industry connection. There was no significant difference between teachers who were connected through having a friend or family member working in the industry and those that had visited an abattoir before. Teachers with a distant connection and awareness of an abattoir in their local region that perceived careers positively did not greatly differ from those who identified as not having any connection ( $n=6$ ,  $n=5$  respectively). However, those without a connection did significantly differ to those with a connection and strong connection. Irrespective of connectedness, no teacher felt negatively about careers in the RMP sector. Meaningful connections to the industry through direct links with people or abattoirs can play an important role in improving teachers' perceptions and knowledge of careers. Similar trends were seen in an NSW teacher study by Cosby et al. (2023b); teachers that had a connection to the agricultural industry in general were more likely to encourage their students to consider a career in agriculture when compared to teachers with a distant or no connection.

**Table 3. Association between the teacher’s connection to the red meat processing sector and perceptions of careers in the red meat processing sector. Values represent frequency of responses for every combination of categorical variables (n=97).**

		<i>How do you feel about careers in the red meat processing sector?</i>				
		Positively	Neutral	Negatively	I don’t know enough	P-value
<i>Connection to the red meat processing sector</i>	I’m strongly connected to the industry with a friend or family member working in the sector	20	4	0	0	<0.001
	I’m connected to the industry and have visited an abattoir before	20	6	0	3	
	I have a distant connection and know of an abattoir in my local area	6	6	0	5	
	I don’t feel connected to the industry	5	9	0	13	

In addition to connectedness, there was a significant positive relationship between teachers’ perceptions of the RMP sector and how they felt positively about career opportunities ( $P=0.001$ , **Error! Reference source not found.**). Teachers who had a neutral perception of the RMP sector were more likely to feel neutral about associated careers. Teachers are well known to be key influencers in informing and exposing students to careers and further education. Therefore, improving teacher connection and awareness of career pathways is key to greater awareness by current students who are the next generation of workers. However, the level and type of support teachers require to develop their perception of RMP careers and considerations as career options for students will differ depending on their connectedness, location, qualifications and teaching program.

**Table 4. Association between the teacher’s positive perception of the red meat processing sector and perceptions of careers in the red meat processing sector. Values represent frequency of responses for every combination of categorical variables (n=97).**

		<i>Overall perception of the red meat processing sector is positive</i>			
		Agree	Neutral	Disagree	P-value
<i>How to do you feel about careers in the red meat processing sector?</i>	Positively	46	4	1	<0.001
	Neutral	14	9	2	
	Negatively	0	0	0	
	I don’t know enough about careers in this sector	11	7	3	

#### **Teacher perceptions of 5 career related statements about the red meat processing sector**

Five RMP sector career focused statements as seen in **Appendix A Q24**, were provided to teachers to select their level of agreement. There was a significant relationship between teachers’ perceptions of careers associated with the RMP sector and the four positively phrased statements about careers as seen in **Table 5** ( $P < 0.001$ ). The negatively phrased statement (i.e., ‘*Jobs in the red meat processing sector are not relevant for academically inclined students*’) was negatively related to the positive perceptions of careers ( $P < 0.001$ ). Teachers with a positive perception were more likely to positively view other statements regarding the RMP sector. Teachers having positive perceptions and confidence in introducing careers in the RMP sector will enable employment opportunities to the next generation to be showcased.

**Table 5 Association between the teacher’s perception of careers in the red meat processing sector and perception across five statements relating to careers. Values represent frequency of responses for every combination of categorical variables (n =97).**

		<i>How do you feel about careers in the red meat processing sector?</i>			
		Positively	Neutral	I don’t know enough	P-value
<i>I am confident to deliver content related to careers in the red meat processing sector</i>	Agree	40	6	5	<0.001
	Neutral	5	10	1	
	Disagree	6	9	15	
<i>There are many job opportunities available in the red meat processing sector for my students</i>	Agree	44	11	9	
	Neutral	4	10	9	
	Disagree	3	4	3	
<i>I would encourage my students to consider a career in the red meat processing sector</i>	Agree	41	7	6	
	Neutral	6	13	14	
	Disagree	4	5	1	
<i>There are many pathways to consider a career in the red meat processing sector</i>	Agree	43	12	7	
	Neutral	7	10	13	
	Disagree	1	3	1	
<i>Jobs in the red meat processing sector are not relevant for academically inclined students</i>	Agree	8	6	1	
	Neutral	1	7	6	
	Disagree	42	12	14	

### **Teacher knowledge of careers associated with the red meat processing sector**

Teachers were asked to list careers they associate with the RMP sector (

**Table 6**), with a total of 439 responses (including replicates). This question was open-ended which provided teachers with the opportunity to freely write in as many jobs and careers they would like, resulting in variations in the level of detail and number of answers provided. One teacher did not provide any answers for this question. The career responses were then grouped into 27 classifications as seen in **Appendix B**. The careers listed included farming, entry-level, physical processing/labour type positions, technical staff who require formal STEM qualifications and training, office and manager/supervisor positions, logistics, butchery as well as other post-processing plant and supermarket careers. The most common careers provided were abattoir workers, butchers, farm and feedlots and transport and logistics.

Teacher qualification and subject matter, including if they taught agriculture, STEM and/or Primary industries, had an effect on identifying correct careers and jobs associated with the RMP sector ( $P=0.04$  and  $P=0.003$ , respectively). The majority of teachers who held a qualification in agriculture provided partially correct answers (both correct and incorrect careers were listed; 78.4%,  $n=29$ ) or correct answers (21.6%,  $n=8$ ). Similarly, the majority of teachers who did not have an agricultural qualification also provided partially correct answers (72.9%,  $n=43$ ), but equally provided correct and incorrect answers (13.6%,  $n=8$ , respectively). In fact, 80.3% ( $n=53$ ) of Agricultural, STEM and/or Primary industry teachers still provided partially correct answers (but also included incorrect answers). Only 18.2% ( $n=12$ ) of Agricultural, STEM and/or Primary industry teachers provided all correct answers. And one provided all incorrect answers. More than half of teachers who taught other subjects provided partially correct answers (63.3%,  $n=19$ ), with 23.3% ( $n=7$ ) unable to provide any correct answers. Only 13.3% ( $n=4$ ) of teachers who taught other subjects provided all correct answers related to careers in the RMP sector. Interestingly, teacher location did not have any effect on teachers' ability to correctly identify careers within the RMP sector. Regardless of qualification and subject taught in schools, 72 teachers out of the 97 that participated in this survey were generally associating the RMP sector with pre-farm gate practices, and the entire supply chain from paddock to plate. In contrast with this perception, the RMP sector encompasses the transport, slaughter, processing and packaging animals for food and has diverse career pathways in logistics, processing and packaging, administration roles, food safety (QA), animal health and welfare, biosecurity, health and safety, marketing and sales, trades and research and development (Marjorie et al., 2008). The generalised assumption that it also includes the pre and post processing careers is reflective of a lack of knowledge regarding the specifics of this sector and has serious implications for student awareness of career pathways. In conjunction, with just over half of the teachers (52.6%,  $n=51$ ) indicating they have confidence in teaching RMP content, there is serious risk of students being educated incorrectly about the RMP sector, potentially impeding their understanding and knowledge of this vital food manufacturing sector.

**Table 6. Careers teachers correctly and incorrectly associate with the red meat processing sector.**

<i>Correct careers in the red meat processing sector</i>	<i>Incorrect careers in the red meat processing sector</i>
Abattoir and food processing	Agronomist
Abattoir workers	Animal nutrition
Administration, data analyst, finance and HR	Banking
Animal welfare officer	Breeding
Biosecurity	Butcher
Environmental advisor	Consumer
Food safety (technicians, QA & assessors)	Farm and feedlots
IT and technology	Food
Health and safety	Retail and supermarkets
Management and logistics	Wholesalers, distributors and factories
Marketing and sales	Stock agents and saleyards
Research and development	
Stockpersons	
Trades, engineers, machinery & maintenance	
Veterinarian	
Transport and logistics	

### **Teacher implementation of the red meat processing sector into the curriculum**

When asked whether they incorporate concepts about the RMP sector into their current teaching program, 60% of participants (n=58) reported that they do, with 52 teaching into Agriculture, STEM and/or Primary industries. The remaining six teachers incorporated these concepts in primary school classrooms (n=3), and Hospitality and food technology subjects (n=2) and careers, health and physical education (n=1) in secondary schools. Teachers who indicated they incorporate RMP concepts into their teaching do so in several ways including in explanation, examples and discussion (22.1%), through integration with curriculum content (19.5%), excursions (10.6%), Paddock to Plate activities (9.7%), practical ‘hands-on’ activities (8.0%), study and research activities (7.1%), carcass and Hoof and Hook type activities or competitions (5.3%), videos (5.3%), other activities and clubs (4.4%), other visual tools (3.5%), work experience programs (2.7%) and guest speakers (1.8%) (data not shown). As discussed previously, many of the teachers participating in this research associated the RMP sector with pre-farm gate practices, and the entire supply chain from paddock to plate, which is likely to have influenced the types of responses. For example, teachers who identified taking students on excursions included correct RMP locations such as processors/abattoirs, but there was also mention of excursions to feedlots, butchers and to agricultural shows.

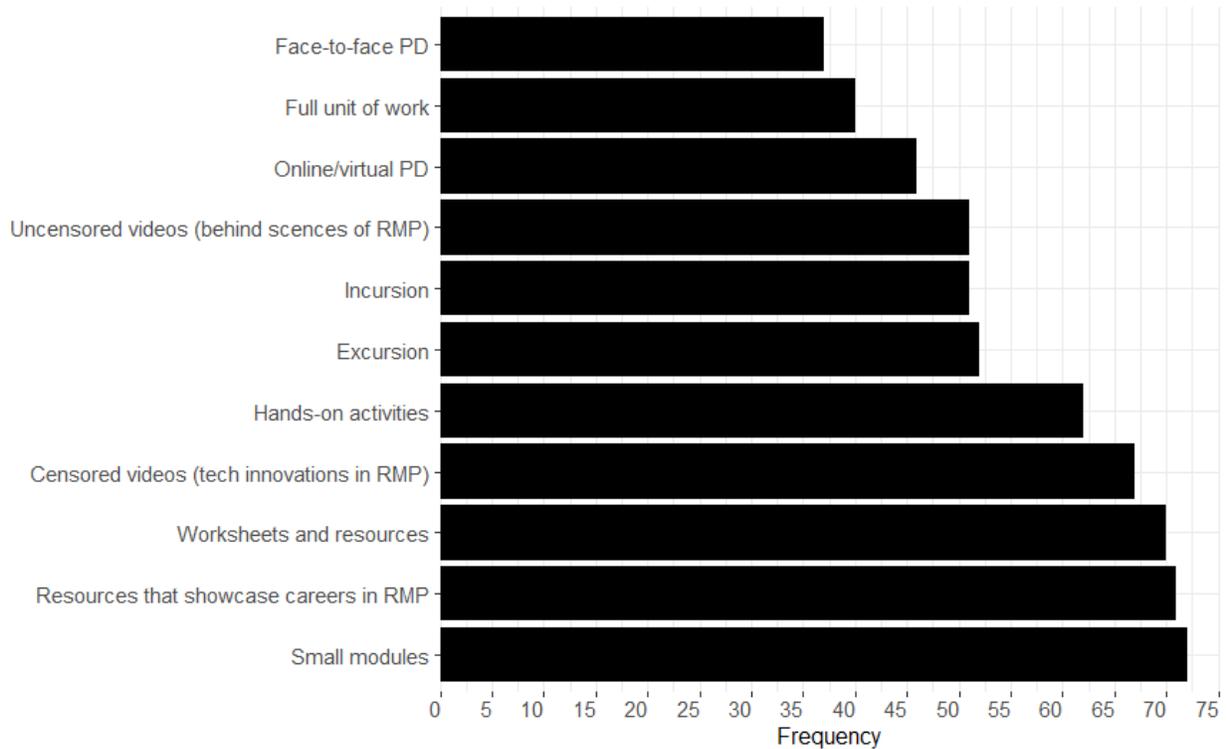
The most prevalent method of implementation of the RMP sector into the curriculum was through explanation, examples and discussions in class, followed by more hands-on methods. Research by Poudel et al. (2005) found that hands-on activities focusing on agriculture and environment improved the confidence and motivation of students to learn whilst providing context of how these sectors relate to themselves and community. In addition, STEM focused hands-on-activities promote critical thinking, and students can recall more information compared to demonstration

teaching (Hartman et al., 2000). This also expands to a willingness to continue to learn and engage (Akins et al., 2019). In contrast, this study found hands-on-activities not as prevalent of teaching methods for the RMP sector, which may be attributed to the type of content and resources available for this sector.

In this study, teachers were asked if they faced any barriers that inhibited them from incorporating RMP concepts into their lessons. The barriers identified include the topic not being clearly aligned with the curriculum in their subjects taught (60.5%), the irrelevance to the curriculum topic being taught or local area (9.3%), not having ever been required to include (7.0%), the sector not being among teaching and learning priorities (7.0%) and teachers' general lack of time (7.0%). Others perceived the content inappropriate (4.7%), the topic not covered yet (2.3%) or no point in teaching the concepts (2.3%). Additional concerns mentioned by teachers included a lack of industry engagement and careers education, with the need to have more proactive engagement from the sector. This is not a new barrier, and in agriculture the need to strengthen industry and school partnerships with greater engagement from industry has been identified and recommended (O'Dea et al., 2024; O'Dea et al., 2022).

### **Teacher identified support to implement the red meat processing sector into the curriculum**

Teachers were then asked what they needed to support their students to aspire to careers in the RMP sector. From an existing set of options (**Appendix A Q25**), they indicated that a variety of resources or opportunities would be useful (**Figure 1**). These ranged from learning modules, worksheets and videos (including both censored versions focusing on technological innovations used in RMP sector and uncensored versions providing a behind the scenes view of the RMP sector) that teachers can use in their classrooms to more hands-on activities. The hands-on activities highlighted were through excursions and incursions with the RMP sector to raise awareness for both the educators and students on career opportunities. Agricultural industry members have established their willingness to participate in industry school partnerships to increase student aspirations and raise awareness of the vast career opportunities through hands-on learning and storytelling (O'Dea, et al., 2024). Hands-on teaching methods are sought out by teachers (Education Council, 2018; Torii, 2018), but can be hindered by available time (Creagh et al. 2025), teacher confidence and understanding of content. The participating teaches also identified the need for more professional development in the form of online and face-to-face workshops and full units of work (**Figure 1**). Teacher professional development in agricultural subjects is a valued method to increase understanding, knowledge and confidence (Dodd, 2011; Manning et al., 2022a). Internationally and domestically, professional development workshops have been run to develop agricultural knowledge and provide activities, resources and units of work to implement into primary and secondary classes (Cosby et al., 2019; Manning et al., 2022a; Walsh & Irving, 2020). Professional development workshops have been successful in improving teacher confidence and willingness to utilise learnings and resources into their classrooms. In addition, professional development would be increasingly useful for early career teachers.



**Figure 1. Support or opportunities that teachers indicated they need to support students to aspire to careers in the red meat processing sector. Frequency indicates the number of times the options were selected.**

## Conclusion

Teachers varied in their knowledge, perception and awareness of the RMP sector and associated careers. Having a connection with people working in the sector or the presence and involvement of an abattoir in their local community increased knowledge and improved positive perception of the sector and its associated careers. Further research is required to determine whether teacher knowledge and awareness translates into student aspirations for a career in the sector. In general, teachers lacked an understanding of what classifies a career in the RMP sector, as seen by the incorrect associations of pre- and post-farm gate careers. This misunderstanding, coupled with half of the teachers feeling confident to teach RMP related content and careers in their teaching programs, poses a risk to student knowledge and understanding of the RMP sector. To improve awareness of the diverse career opportunities for the next generational workforce, stronger partnerships between schools (teachers) and industry (processing plants) need to be developed. In addition, hands-on, curriculum aligned learning opportunities and experiences through tours or in-class visits are required to raise the profile and attract a talented, diverse, and dedicated workforce to the RMP sector. Based on the findings of this research it is recommended that future projects 1) Recruit and train willing processors to host and visit local secondary and primary schools; 2) Provide secondary school students with the opportunity to tour a local processing plant and primary school students to have an industry representative attend an in-class visit; 3) Develop hands-on learning activities aligned to curriculum with a focus on innovations and technological advances in the RMP sector and the associated career pathways; and 4) Deliver

teacher professional development to build the capacity and capability of primary and secondary teachers to incorporate correct RMP concepts into the classroom to showcase the diverse career opportunities available. These recommendations are designed to establish and build sustainable relationships between local schools and processing plants, for lasting impact to attract the next generation workforce into the RMP sector.

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