



# Exploring adolescents' perceptions of dairy farming careers in Ireland: views of students studying agricultural science in secondary school

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## Abstract

*A global challenge for dairy farmers is the attraction and retention of people to careers in primary agriculture. This study aimed to explore the perceptions of Irish secondary-level students studying agricultural science towards careers in dairy farming. Quantitative data were collected via a national survey (n = 976) prior to collection of qualitative data via two focus groups. Descriptive statistics including frequencies, percentages and means were used to analyse the quantitative data. Data analysis of the survey results identified general themes, which contributed to a deductive assessment of the overarching hypothesis, supplemented by inductive reasoning based on the analysis of the data from the focus groups. From the survey, adolescents perceived dairy farming as a physically demanding job with a poor work–life balance without any extra financial reward compared to other careers. In the focus groups, participants expressed concerns about environmental sustainability and economic viability. They also identified the ageing farming population as making it a less attractive career for young people. The paper supports arguments for greater integration of actual labour market opportunities into the secondary school curriculum to raise aspirations for 21st century careers in dairy farming, among other careers. There is an opportunity within the agricultural science curriculum to encourage students to explore the wide spectrum of emerging careers in food systems including dairy farming through classroom discussion, ideally with a variety of role models employed in the agricultural sector.*

## Keywords

Adolescents • agricultural literacy • career aspirations • gender

## Introduction

Negative perceptions as well as gender stereotyping of dairy farming are contributing to the challenge of attracting and retaining people to careers in primary agriculture (Malanski *et al.*, 2019). This is a global challenge for dairy farmers despite the increasing availability of job opportunities. Although dairy farm numbers have decreased in many countries (Dairy Australia, 2015; Teagasc's National Farm Survey (NFS) 2017; MacDonald *et al.*, 2020), herd sizes have increased resulting in an increased dependency on hired labour (Hadley *et al.*, 2002; Deming *et al.*, 2018). This trend is particularly evident in Ireland since 2015 due to the removal of European Union (EU) milk quotas, where it is predicted that growth will continue and that an additional 6,000 people will be required to work on dairy farms by 2025 (Teagasc, 2017). When hired labour is required, many developed countries are dependent on immigrants to work in the industry but events such as the coronavirus disease 2019 (COVID-19) global pandemic have highlighted the precariousness of being heavily reliant on migrant workers.

To increase the number of recruits into the industry, adolescents must perceive dairy farming as an attractive career with good prospects. In 2018, the Organisation for Economic Co-operation and Development (OECD)'s Programme for International Student Assessment (PISA) collected data on the career dreams of young people, how they have changed over the past 20 yr, how closely they are related to actual labour demand and how closely aspirations are shaped by social background and gender (Mann *et al.*, 2020). Comparing the PISA 2018 data with those from 2000, the results show that the career expectations of young people have become more concentrated in fewer occupations and that it is overwhelmingly careers with origins in the 20<sup>th</sup> century and unaware of 21<sup>st</sup> century market realities (Mann *et al.*, 2020). Mann *et al.* (2020) suggest that labour market signals are failing to reach young people: young people struggle to develop informed, nuanced understandings of the labour market and how they might ultimately engage in it.

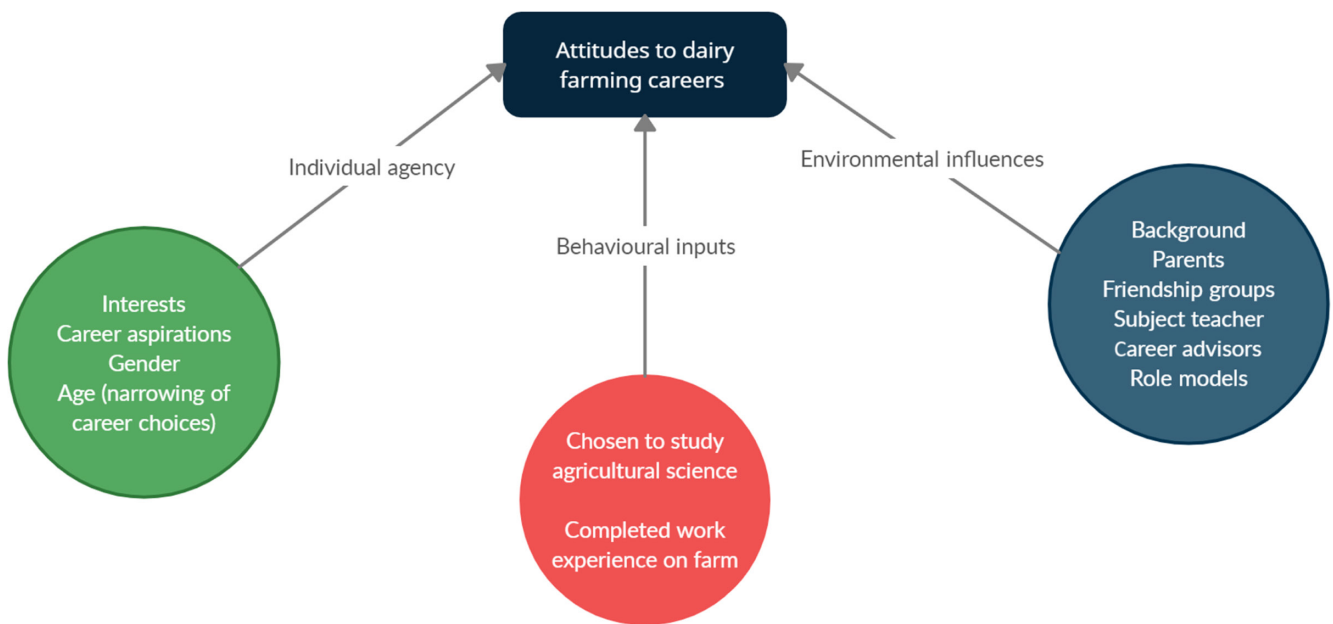
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Adolescents' attitudes towards careers in dairy farming are subject to perceptions about farm ownership and succession as influenced by gender, potential income and work-life balance (Beecher *et al.*, 2019). There are many factors influencing how adolescents perceive dairy farming careers including, *inter alia*, where they live, their family background, their education and their media consumption (Lent *et al.*, 2002). With 63% of the Irish population living in urban areas (CSO, 2016), there may be less engagement with agricultural life than in previous generations. Similarly, in other European countries such as the Netherlands, there is a shift away from an agrarian society towards an urban population with less direct experience and knowledge of agriculture (Boogaard *et al.*, 2011). In an era where there is decreasing awareness as to how food is produced and the reasons behind on-farm practices in conjunction with increasing consumer demand for transparency and accountability such that the social licence to farm is increasingly subject to debate (Edwards & Trafford, 2016), there is a need for meaningful two-way engagement between the dairy sector and the public (Weary & von Keyserlingk, 2017). There is a real value in the next generation of citizens being agriculturally literate because of the impact of farming upon our society, the economy, the environment and personal health (Kovar & Ball, 2013). Meischen & Trexler (2003) define agricultural literacy as the ability to engage in social conversations about agriculture and food systems, identify national and international issues and pose and evaluate arguments based on scientific evidence. The role of agricultural education in schools in supporting agricultural literacy is becoming increasingly important, helping learners construct viable ideas about modern agriculture, sustainable food production and career opportunities through contextually rich formal and informal agricultural experiences (Fraze *et al.*, 2011; Hess & Trexler, 2011; Fizer, 2013). Basic agricultural literacy is a pre-requisite to interest in careers in agriculture. Agricultural educational programmes are essential for recruitment into post-secondary agricultural education programmes and consequently into an agriculture-related career (Scott & Lavergne, 2004). Beecher *et al.* (2019) found that Irish secondary-level students who studied agricultural science had, unsurprisingly, much better knowledge of the realities of dairy farming and a higher level of interest in agriculture-related careers. In this paper, the focus is on students who select to study agricultural science in school at secondary level to better understand their perspectives on potential careers in agriculture and in the dairy industry. These insights may be useful in helping the dairy industry consider how it may better engage and communicate with young people about the potential career opportunities available to them. Agricultural science is an increasingly popular subject in Irish secondary schools as evidenced by the increasing number taking the subject for their final state examinations

(Leaving Certificate). In 2003, just over 2,000 students took agricultural science for the Leaving Certificate compared with 7,745 in 2019, representing about 14% of the student cohort for the Leaving Certificate that year (Irish State Examination Commission; <https://www.examinations.ie/statistics>). Its growing popularity is linked to its recognition as a laboratory science subject for entry to most third-level courses and its overlap with subjects such as biology and geography. The curriculum specification for Leaving Certificate Agricultural Science is designed to prepare students for immediate entry into society and the world of work, or to further education and training and aims to highlight careers across the agriculture and food sectors. Students who study agricultural science have a greater knowledge about agriculture, express more favourable beliefs about agricultural careers and are more inclined to consider agricultural science as an area of study than those without such exposure (Knobloch *et al.*, 2007; Beecher *et al.*, 2019).

Social cognitive career theory (Lent *et al.*, 2002) examines the processes during which individuals form interests, make choices and attain success in career and academic pursuits. The theory incorporates the interplay between individual agency (one's capability to originate and direct actions for given purposes), social interactions and where the influence of the environment, family and society intersects with individual agency. Learning experiences, self-efficacy (beliefs about one's own capabilities) and outcome expectations in the career development process are key components of social cognitive career theory. In essence, social cognitive career theory considers environmental/social contexts and self-efficacy as the two pivotal aspects of an individual's formation of career aspirations. The key concepts from the theory used in the survey and focus groups are displayed in Figure 1.

School subject choices and experiences affect subsequent career choices. The impacts of gender stereotypes and self-efficacy beliefs in Science, Technology, Engineering and Mathematics (STEM) subjects are widely studied (Rogers & Creed, 2011; Robnett & Leaper, 2013; Uitto, 2014). The negative impacts of stereotyping and self-efficacy beliefs can potentially be mediated through the influence of teachers and/or friends' participation in these subjects. Subject teachers influence the perceptions of students towards different career choices (Christidou, 2011; Byrne *et al.*, 2012; Hearne & Galvin, 2015). Hazari *et al.* (2010) consider the importance of the student's connection with the subject area that is influenced by their interest, performance, competence and recognition by others can influence their career plans. The influence of parents on career choices is widely recognised (Matthews & Falvey, 1999; Fizer, 2013; Beecher *et al.*, 2019) while Robnett & Leaper (2013) also point to the influence of friendship groups. They examined the association between friendship groups and the participants' interest in STEM. They found that



**Figure 1.** Key concepts from social cognitive theory (Lent *et al.*, 2002) used to investigate adolescents' attitudes and perceptions to dairy farming careers.

when girls have a primarily female friendship group, it is more likely to enforce gender role norms and girls may find it more difficult to view STEM as compatible with their social gender identity. Other research also found that friendship groups, which are more homogenous in gender composition, might be more likely to enforce gender role norms (Breakwell *et al.*, 2003; Leaper & Smith, 2004).

Attracting young people especially women to careers in farming or indeed to rural life is necessary not only in terms of generational renewal on farms but also in terms of the viability of rural areas (Connolly *et al.*, 2012). In Ireland, Beecher *et al.* (2019) and Cassidy (2019) point to the continued prevalence of the view that to be a farmer, one must be male and from a farm while the norm for entry to the profession of farming continues to be transgenerational succession within the farm family (Deming *et al.*, 2019). However, the entry routes for women into farming are affected by social customs and life course as for many women access to land is directly tied to a male partner (Pilgeram & Amos, 2015). Cassidy (2019) also highlights the Irish perspective on the male farm successor as having an intuitive understanding of the land, emotionally attached to the farm and to be either privileged (because of receiving the farm) or stigmatised (because of lower educational attainment and lacking flexibility in life choices). There is some evidence from a US study that suggests youth are uninterested in farming (White, 2012) and ultimately farming careers. Youth studies is an emerging field and White

(2012) argues that it can help us understand why people turn away from farming, including the downgrading of farming and rural life. In the context of increasing opportunities for rewarding careers in dairy farming, this study aims to explore the understanding that Irish adolescents have of careers in the sector and how these perceptions are influencing their career choices through the lens of social cognitive career theory. By focusing on adolescents studying agricultural science in school at secondary level, there is an expectation that they will have developed a more informed and nuanced understanding of the career prospects in dairy farming. Understanding how adolescents who have an interest in agriculture perceive dairy farming careers could provide insights into how best to support adolescents in considering the potential opportunities available to them within the dairy industry.

## Materials and methods

A mixed-methods approach was used in this study by combining both quantitative and qualitative research methods. Quantitative data were collected via a survey of students across the Republic of Ireland prior to collection of qualitative data via two focus groups. The study is innovative in that there have been relatively few studies globally of school-age adolescents studying agricultural science. The survey was conducted in

late 2017/early 2018 with the specific purpose of providing a representative overview of adolescents' perceptions of dairy farming careers. The survey was analysed before conducting the focus groups in 2020 to identify key topics to explore with adolescents during the focus groups. The focus groups were chosen to complement the survey instrument and research findings from the focus groups were triangulated with reference to the results of the survey. The focus groups allowed for a more in-depth discussion with adolescents on their views of dairy farming, providing a deep and rich understanding of their perceptions. The Teagasc ethics committee granted ethics approval.

### Study 1: quantitative study

Survey analysis is considered the most appropriate method of gathering information on characteristics and opinions of large groups of people at relatively low costs (Coleman, 1958; Kelley *et al.*, 2003). To maximise the number of responses, the survey was deliberately kept simple but still captured the basic elements of social cognitive career theory. The purpose was to capture the interplay between individual agency and the external environmental influences on career choice formation at a national level. The survey consisted of 18 questions based on the study by Beecher *et al.* (2019). Questions incorporated concepts regarding (1) agriculture, (2) perceptions of dairy farming, (3) career support/advice. Responses to the survey questions varied from open-ended questions to tick the box style questions (yes/no; Bryman, 2001). The survey design and layout was created using an online survey package (Survey Monkey Inc., 2014).

### Survey administration

The target population was second-level students who elected to study agricultural science for their Leaving Certificate. These students would typically be aged between 16 and 19 yr. The Irish Agricultural Science Teachers Association provided contact details for 103 agricultural science teachers in Ireland in 103 schools. In 2020, 434 schools offered agricultural science as a subject for the Leaving Certificate with a similar number of schools offering it in previous years (Evin O'Flanagan, personal communication). The teachers were randomly selected and in December 2017, each teacher was mailed a survey pack which contained the questionnaire, a cover letter and a return-addressed envelope. The completed surveys were returned by February 2018 and transcribed into the online survey package (Survey Monkey Inc., 2014). From 7,745 students who studied agricultural science (Irish State Examination Commission; <https://www.examinations.ie/statistics>), 976 (13%) students completed the survey. The responses represent a 3% margin of error and 95% confidence interval. Therefore, the results of this survey are

deemed to be representative of second-level agricultural science students nationally.

### Data analysis

Descriptive statistics including frequencies, percentages and means were used to analyse the quantitative data in SAS (SAS Inst., 2012). The relationships of background variables (background, school type) with perceptions of dairy farming careers were examined using cross-tabulation and chi-square analysis in JMP (SAS, 2014). Statistical differences were considered significant using a 0.05 significance level.

### Study 2: qualitative study

In March 2020, in-depth focus groups with agricultural science students aged between 16 and 19 yr were held in two schools. The focus groups were co-facilitated by the first and third authors who are both trained in the qualitative methods used. The schools were situated 77 km apart and both were located in Co. Cork, Ireland. Cork has the largest proportion of Ireland's dairy herd with a total of 380,772 dairy cows (25%) (ICBF, 2019), and therefore represents a region in Ireland with a high concentration of dairy farmers. Cork also had the highest number of schools offering agricultural science as a subject for the Leaving Certificate, with 52 schools offering it as a subject (Department of Education, 2021, personal communication). Consequently, it is expected that adolescents in the region would be more familiar with dairy farming careers and therefore a possibility of a greater understanding of the varied career opportunities. Schools were selected through a contact (an agricultural science teacher) of the first author who provided contact details for other schools that would be willing to participate. Details of the 30 participants are presented in Table 1. Each focus group lasted for 1 h and 20 min. Further visits to a number of schools were cancelled due to the COVID-19 outbreak. The authors are conscious that with only two focus groups data saturation was not reached; however, the focus group findings add depth to our understanding from the survey. The

**Table 1:** Details of the agricultural science students who participated in the two focus groups

	School 1	School 2
Year of education	Year 14 adolescents	Year 13 adolescents
Number of participants	13 (11 females; 2 males)	17 (4 females; 13 males)
Background	7 from a farming background; 6 from a non-farming background	12 from a farming background; 5 from a non-farming background

facilitators were introduced to the class and the purpose of the focus group was explained. The students were asked an “ice-breaker” question to start and then asked to list the reasons for choosing to study agricultural science. In their sub-groups, the participants were facilitated to complete a flexible brainstorm to answer the question “What do you want/hope for in your career/working life”. Participants selected 4–5 images that represented what they want in their careers from an assortment of images (cut from newspapers and magazines, both farming and non-farming media and carefully selected by the authors to ensure that gender stereotypes and norms were not perpetuated). Participants were then asked to create a collage based on commonality between images and discuss in-depth the results of their brainstorming exercise. Finally, the participants were asked to generate and share ideas for jobs relating to agriculture. The facilitators took photographs of the collages and wrote up detailed notes during and immediately following each focus group session. The authors deliberately decided against audio recording the focus groups to ensure the protection of the students, who were asked to share their perspectives on some difficult topics of conversation.

### Data analysis

Immediately after each focus group, we reviewed our notes and made additional notes. Then, we shared, discussed and reviewed our notes. Next, the notes, flip charts and the collages from the flexible brainstorming were analysed for key themes. Primarily a deductive approach was applied to analyse the data against the key themes that were identified from the national survey but some inductive reasoning was also applied as some unanticipated issues were raised by the adolescents. A cyclical process was used to discuss and integrate findings. Findings were discussed among the co-authors and codes and themes were developed. The initial results were written by the third author and circulated to the first author for review. Track changes were used to edit and comment on findings until a consensus was reached.

## Results

### Survey results

A total of 976 students studying agricultural science from 44 secondary schools in Ireland completed the survey (Figure 2). The respondents came from all over Ireland as shown in Figure 3, with 20% coming from Co. Cork and 45% from the five counties of Munster, which is similar to the geographical distribution of dairy farmers (CSO, 2018). Of the 44 schools, 3 schools were all-female (59 students), 11 schools were all-male (213 students) and 30 schools were co-educational (700 students). Of the respondents, 420 (43.7%) were from a farming background, and the remaining were from a non-



Figure 2. Location of schools surveyed.

farming background with the majority (366) living in rural areas. The majority of respondents either know or vaguely know a dairy farmer well (882, 91.3%). Only 84 respondents did not know anyone dairy farming; of those, 16 (19%) attended an all-female school, 17 (21%) attended an all-male school and 50 (60%) attended a co-educational school.

Respondents' attitudes to dairy farming by background are presented in Table 2. There was an association between background and the perception that dairy farming provides equal opportunities for males and females, offers a variety of career opportunities and is strongly promoted to young people ( $P < 0.001$ ). In addition, adolescents' background was also associated with the perception that dairy farmers are good employers ( $P < 0.001$ ). Respondents' attitudes to dairy farming by school type are presented in Table 3. There was an association between school type and the perception that dairy farming provides equal opportunities for males and females, offers the opportunity to have a good social life, requires high skill levels and is strongly promoted to young people ( $P < 0.05$ ). In addition, dairy farming is perceived as a physically demanding job (92%) requiring hard or really hard work by 89% of respondents with a poor work–life balance (67%) without any extra financial reward (43.9%) compared to other careers.

## Distribution of survey respondents

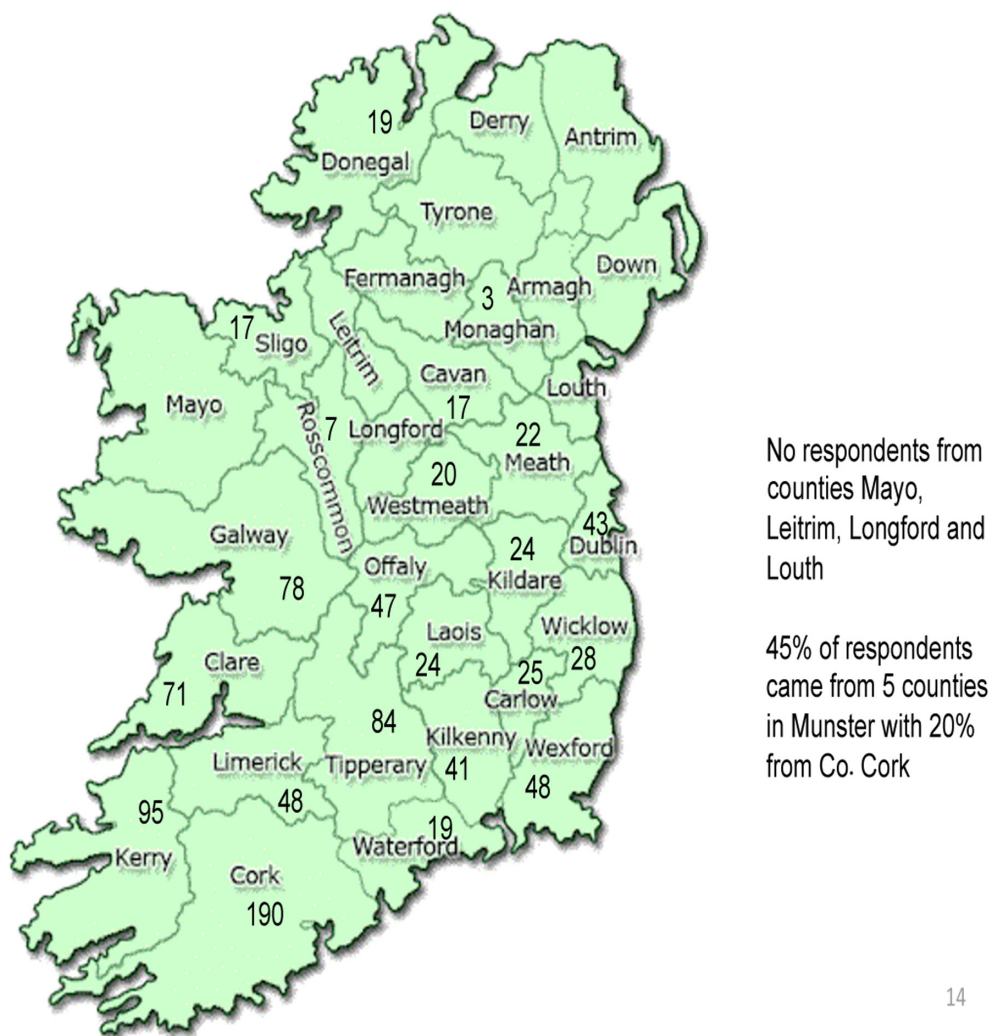


Figure 3. Distribution of survey respondents.

Key influencers on respondents' career choices included parents (476, 44.4%), no one (201, 18.7%), family other than parents (154, 14.4%) and teachers (112, 10.4%). Other much less influencers mentioned included friends, the economy, farmers, internet and hobbies (105, 9.9%). When asked who would they go to for advice on careers, 568 (57.0%) adolescents mentioned career guidance counsellors with family (parents, siblings, aunts, uncles and cousins) being the second most common answer (197, 19.8%).

Participants were asked an open question regarding what factors they would consider as important when choosing a career (maximum three factors). Their answers were reviewed

and recoded and the results are shown in Table 4. The top three career factors were the same for those attending all-female schools, all-male schools and co-educational schools; however, the order varied between respondents. For all-female schools, job satisfaction was mentioned by 90% of respondents followed by pay/income (65%) and working time off/hours (47%). Whereas for all-male and co-educational schools, pay/income was mentioned by 87% and 84% of respondents, respectively. For all-male schools, the next most common answer was working time off/hours (79%), followed by job satisfaction (60%) with the order reversed for those in co-educational schools (job satisfaction – 76%; working time

**Table 2:** Agricultural science students' attitudes to dairy farming by background

Statements	Total responses (n)	City dweller n (%)	Farm dweller n (%)	Rural dweller n (%)	Chi-square test of independence
There are equal opportunities for males and females	950				
Yes		107 (17)	313 (48)	227 (35)	$\chi^2 = 17.48$
No		67 (22)	103 (34)	133 (44)	$P \leq 0.001$
Dairy farming can allow you to have flexible working hours	944				
Yes		46 (27)	99 (24)	98 (27)	$\chi^2 = 1.05$
No		136 (73)	312 (76)	263 (73)	$P = 0.59$
Dairy farming allows you to have a good social life	945				
Yes		59 (35)	153 (37)	139 (38)	$\chi^2 = 0.57$
No		110 (65)	260 (63)	224 (62)	$P = 0.75$
Dairy farmers are good employers	935				
Yes		130 (76)	333 (892)	248 (70)	$\chi^2 = 14.9$
No		41 (24)	75 (18)	108 (30)	$P \leq 0.001$
Dairy farming is a safe industry	943				
Yes		65 (38)	171 (42)	128 (36)	$\chi^2 = 2.82$
No		107 (62)	241 (59)	231 (64)	$P = 0.24$
Dairy farming involves a variety of tasks	954				
Yes		171 (98)	400 (96)	347 (96)	$\chi^2 = 2.52$
No		3 (2)	17 (4)	16 (4)	$P = 0.28$
Dairy farming is physically demanding	951				
Yes		159 (91)	382 (92)	334 (92)	$\chi^2 = 0.13$
No					$P = 0.94$
Dairy farming requires high skill levels	950				
Yes		125 (72)	287 (69)	241 (67)	$\chi^2 = 1.82$
No		48 (28)	128 (31)	121 (33)	$P = 0.40$
To be a successful dairy farmer it is necessary to own your own farm	943				
Yes		78 (45)	219 (53)	179 (50)	$\chi^2 = 2.92$
No		94 (55)	194 (47)	179 (50)	$P = 0.23$
Dairy farming offers many career opportunities	948				
Yes		46 (26)	176 (43)	101 (28)	$\chi^2 = 23.38$
No		128 (74)	238 (57)	259 (72)	$P = 0.23$
Dairy farming is strongly promoted to young people	947				
Yes		27 (16)	119 (29)	60 (17)	$\chi^2 = 21.22$
No		147 (84)	295 (71)	299 (83)	$P \leq 0.001$

**Table 3:** Agricultural science students' attitudes to dairy farming by school type

Statements	Total responses (n)	All-female school, yes; n (%)	All-male school, yes; n (%)	Co-educational school, yes; n (%)	Chi-square test of independence
There are equal opportunities for males and females	962	24 (40.7)	158 (74.9)	471 (68.1)	$\chi^2 = 24.78$ $P \leq 0.001$
Dairy farming can allow you to have flexible working hours	956	12 (20.3)	60 (28.6)	173 (25.2)	$\chi^2 = 1.89$ $P = 0.39$
Dairy farming allows you to have a good social life	957	13 (22.0)	92 (43.6)	250 (36.4)	$\chi^2 = 9.71$ $P \leq 0.001$
Dairy farmers are good employers	946	51 (86.4)	164 (78.8)	505 (74.4)	$\chi^2 = 5.45$ $P = 0.07$
Dairy farming is a safe industry	955	16 (27.1)	77 (36.5)	272 (39.7)	$\chi^2 = 3.99$ $P = 0.14$
Dairy farming involves a variety of tasks	966	58 (98.3)	205 (96.2)	667 (96.1)	$\chi^2 = 0.73$ $P = 0.69$
Dairy farming is physically demanding	963	57 (96.6)	195 (91.5)	634 (91.8)	$\chi^2 = 1.82$ $P = 0.40$
Dairy farming requires high skill levels	962	49 (83.1)	133 (63.3)	478 (69.0)	$\chi^2 = 8.47$ $P = 0.01$
To be a successful dairy farmer, it is necessary to own your own farm	954	29 (50.0)	102 (49.0)	349 (50.7)	$\chi^2 = 0.19$ $P = 0.92$
Dairy farming offers many career opportunities	959	14 (23.7)	76 (35.8)	235 (34.2)	$\chi^2 = 3.10$ $P = 0.21$
Dairy farming is strongly promoted to young people	959	4 (6.8)	45 (21.5)	160 (23.2)	$\chi^2 = 8.6$ $P \leq 0.05$

**Table 4:** Factors influencing agricultural science students' choice of future career

	First	Second	Third	Total (n)	Percentage
Pay/income	371	252	132	755	77%
Job satisfaction	348	160	154	662	68%
Working hours/time off	124	281	221	626	64%
Location	10	23	62	95	10%
Skills required	24	33	24	81	8%
Career opportunities	7	19	27	53	5%
Work conditions/culture	0	17	30	47	5%
Job availability	6	13	16	35	4%
Agricultural/farm related	5	9	3	17	2%
Safety/security	3	10	7	20	2%
Exam results	6	8	5	19	2%
Travel opportunities	1	3	7	11	1%
Miscellaneous	31	79	127	237	24%



off – 71%). Any students attending all-female schools did not mention travel opportunities, safety or security of the career. Of the 520 respondents (54.6%) who would recommend farming as a career, only 20 attended an all-female school, and 113 attended an all-male school while 384 attended a co-educational school. There was an association between adolescents' background and if they would recommend farming ( $\chi^2 = 21.59$ ,  $P < 0.001$ ), with a higher percentage of those from a farming background recommending farming (63%) compared with urban/city dwellers (42%) and rural non-farm dwellers (52%). There was 50:50 split between being from a farming and non-farming background while the majority (95%) vaguely know or know a farmer well. Participants were asked to explain why they would recommend farming and their answers were recoded and presented in Table 5. Despite the positive responses, respondents associated farming with hard work, long hours and was time consuming. For those who responded “no”, a wide variety of reasons were given (Table 6).

### Vignette

Further analysis of the question “Would you recommend dairy farming as a career” ( $n = 952$ ) revealed that six schools (one all-male, five co-educational) accounting for 111 respondents would strongly (>70% of respondents) recommend dairy farming and four schools (one all-female, three co-educational) accounting for 57 respondents would strongly not recommend (>75% of respondents) dairy farming as a career. The all-female school was located in Dublin city,

one of the co-educational schools was also located in Dublin city and two were rural schools. Comparing these “pro” and “anti” dairy farming cohorts illustrates how social cognitive theory influences adolescent perceptions, in particular the environmental context. Respondents in the all-male school had a pre-dominantly rural and farming background (16 from a farm, 6 rural non-farming, 1 urban dweller). Of the 23 respondents from the all-male school, only one respondent would not recommend farming as a career. All respondents know or vaguely know a dairy farmer. Respondents perceived farming to be physically demanding and hard work but offered a good lifestyle, good income and the opportunity to work for yourself. Of the 23 male respondents, 15 believed there were equal opportunities for males as females in dairy farming. On the other hand, 12 of the 16 respondents in the all-female school would not recommend farming as a career. All respondents were living in the city or urban areas with only seven students knowing a dairy farmer. All respondents perceived farming to be physically demanding and hard or really hard work and cited these as reasons for not pursuing a career in dairy farming as well as the job being boring, not enjoyable and availability of other jobs. Seven of the 16 respondents believed there were equal opportunities for females as males in dairy farming.

### Qualitative results

The links between the focus group findings regarding attitudes to careers in agriculture and the elements of social cognitive theory are presented in Table 7. Almost two-thirds of the

**Table 5:** Agricultural science students' reasons for recommending dairy farming as a career

Order	Recoded response	Frequency
1	Good income	128
2	Be interested	68
3	Job security (good career and good prospects)	63
4	Outdoor, healthy, good lifestyle	62
5	Enjoyable and satisfying	38
6	Negative work culture (long hours, hard work, a lot of work, time consuming)	32
7	Independence	19
8	Easy	14
9	Working with animals	13
10	Positive work aspects (good experience, variety of skills and work)	12
11	Need to be from a farm	7
12	Travel opportunities	4
12	Importance to economy and world trade	4
12	Need scale to be profitable	4
12	Need good knowledge and experience	4

**Table 6:** Agricultural science students' reasons for not recommending dairy farming as a career

Order	Recorded response	Frequency
1	Hard and a lot of work	137
2	Time consuming and poor social life	81
3	Poor remuneration	67
4	Long hours	53
5	Boring/no interest	19
6	Lack of knowledge about dairy farming	13
7	Need to be interested/passionate	12
8	Expensive and hard to set up	11
9	Stressful, risky and uncertain income, debt	15
10	Work conditions and culture (smelly, dirty, isolation, dangerous, early mornings)	10
10	Career insecurities and limited career options	10
11	Future developments – farming insecure	6
11	Need scale to be profitable	6
11	Requires knowledge, patience and experience	6
12	Availability of other jobs	5
13	Need to be from a farm	4
14	Positive aspects (rewarding, good remuneration)	3
14	Moral and ethical issues with farming	3
15	Young people are lazy and impatient	2
15	Lack of travel opportunities	2
15	High level of responsibility	2

**Table 7:** The links between the focus group findings regarding attitudes to careers in agriculture and the elements of social cognitive theory

Social cognitive theory construct	Focus group findings
Environmental/contextual influences	<ul style="list-style-type: none"> <li>– Uncertainty and volatility regarding careers in agriculture due to: <ul style="list-style-type: none"> <li>– Potential negative impact of Brexit</li> <li>– Coronavirus</li> <li>– Rise of veganism</li> <li>– Sustainability issues – environmental, social and economic</li> </ul> </li> <li>– Gender stereotypes</li> <li>– Background</li> </ul>
Individual agency	<ul style="list-style-type: none"> <li>– Interest in the subject of agriculture</li> <li>– Gender stereotypes</li> <li>– Parental career expectations</li> <li>– Influence of subject teachers and role models</li> <li>– Career aspirations including desire to travel</li> </ul>
Behaviour	<ul style="list-style-type: none"> <li>– Completed work experience on farms</li> <li>– Intention to attend agricultural college</li> </ul>

adolescents in the focus groups came from farms and some of the others had gained their interest in agricultural science through work experience on farms. Interest in the subject was the primary reason adolescents chose to study agricultural science. There was also some acknowledgement of the influence of teachers, parents and peers and that it was a subject where students could perform well if they already had knowledge of farming.

The brainstorming session generated a wide variety of career interests and it appeared that adolescents were still at the stage of exploring and weighing up the attractions and prospects for different types of careers. A wide variety of careers were mentioned including: teaching agricultural science, farm manager, jockey, social worker, psychologist, dietician, nurse, marine engineer, architect, interior designer, event organiser, travel writer, vet, zoo manager, primary teacher, special needs assistant, actor, make-up artist and joining the army. Aspects of self-efficacy were suggested when students discussed the kinds of careers they thought they might pursue. Gender stereotypes emerged as a key shaper of aspirations with young women expressing more interest in caring type roles, such as primary school teacher, social worker, physiotherapist and nurse. When asked to discuss what they wanted from their careers, the most commonly shared aspiration was the desire to travel. Very few of the adolescents said they wanted to be their own boss despite some of their parents managing their own businesses. A secure income was a much higher priority, which may indicate an aversion to risk. There were mixed views over the merits of outdoor work compared with indoor or office work and also on the merits of flexible working. In both schools, the adolescents articulated the belief that they had more opportunities than their parents, and that their parents hoped they would “do better than they did”. The message they internalised from parents was that they should do something they enjoy while also getting a secure job with a common parental question being “What kind of job can you get from that qualification?” One idea that emerged was that they would be representing their families in whatever career they chose.

When it came to considering a career in farming, the adolescents said that most parents would be “shocked” if they said they wanted to farm and it appeared to be considered a low status job. The young women said that older people already viewed their interest in jobs relating to agriculture as strange in a somewhat negative light. Some of the young men had plans and expectations of attending agricultural college and some males and females said they might be farmers if they inherit their home farm but their expectation was for part-time rather than full-time farming. Relative to other job opportunities, they felt that farming required harder work for poorer remuneration. In both schools, the adolescents generated a comprehensive list of careers related to

agriculture and farming from farm manager to the provision of agricultural advice, sales, research, science and contracting. A variety of factors were explored with the adolescents to examine how they might influence their perceptions of career opportunities in farming and agriculture. Volatility and uncertainty regarding careers in dairy farming were common themes in both schools with adolescents mentioning the recent crisis in the Irish beef sector as well as the impending challenges of Brexit and the coronavirus as well as the rise in veganism. Adolescents discussed the importance of food security but voiced concerns about the negative impact of farming on the environment and viewed small-scale farming as more environmentally sustainable but not economically so. The age structure and late succession were also raised as negatively impacting their view of the sector. They were asked if they could think of any role model farmers who were creating a positive view of farming; a small number of sportsmen and entrepreneurial farmers (all male) were mentioned.

## Discussion

One of the challenges facing the dairy industry as it expands is the dearth of people pursuing careers in primary agriculture despite an increasing demand. In Ireland, there are more people than ever studying agricultural science as part of their final state examinations. This study demonstrates that agricultural science students' perceptions of dairy careers are more nuanced than previously thought (Beecher *et al.*, 2019). Beecher *et al.* (2019) found that survey respondents generally had a negative perception of dairy farming careers but adolescents studying agricultural science were often more positive about the industry. This study delved deeper into understanding the perceptions of adolescents studying agricultural science at post-primary education, and found that while adolescents still hold traditional views of careers in dairy farming they are also considering the wider context and the role of agriculture in their communities and society as well integrating their subjective and objective views about agriculture. This study highlights important lessons for the industry to act on if the next generation are to be attracted to farming careers. A consistent emphasis was placed by the students on wanting a good work–life balance with reasonable working hours for a good income but there was mixed views on whether these values could be achieved with a career in dairy farming. This work builds on the growing literature of young farmers placing more emphasis on a greater work–life balance and a shift in occupational identities of farmers towards managerial functions facilitated by agricultural education (Deming *et al.*, 2019). However, as previously mentioned, a limitation to the present study was that only two focus groups were conducted; therefore, the discussion and

implications discussed here are exploratory and indicative of adolescents' perceptions of dairy farming careers.

Social cognitive theory was used to provide a conceptual framework to understand how different factors influenced students' agency to choose dairy farming as an attractive career and self-efficacy around whether or not they too could be successful dairy farmers. Environmental/social contexts and self-efficacy/personal inputs were the two key elements of the theory in the present study, while behavioural factors were less dominant. The study findings suggest that engaging teachers and discussing career options with parents can both be positively influential in supporting adolescents' career choices.

Adolescents in the present study highlighted remuneration and work–life balance as issues with dairy farming careers. Dairy farming was the most profitable Irish agricultural enterprise in 2019 with an average income of €64,137 (Dillon *et al.*, 2020), which was higher than average annual earnings for full-time employees nationally in 2019 (€48,946; CSO, 2020). The dairy sector needs to do more in terms of engaging with adolescents to provide facts about the realities of working in the industry including the remuneration benefits. In terms of annual hours worked, the Central Statistics Office of Ireland defines a full-time employee as someone who works 1,800 h/yr. This is almost 600 h less than what dairy farmers worked in 2018, but there was large variation between farms (Buckley and Donnellan, 2020). The same report noted that while annual hours worked was declining, dairy farmers worked significantly more hours on-farm compared with sheep, tillage or drystock farmers (Buckley and Donnellan, 2020). Other livestock-related professions are also perceived to have issues with poor work–life balance and remuneration. The challenge of poor work–life balance and related stress has been highlighted as a problem for recruitment and retention of personnel in other professions such as veterinary (Heath, 2007; Tomlin *et al.*, 2010; Bell *et al.*, 2019), so it is pertinent for the dairy sector to actively address this through advisory and other means.

### **Agricultural literacy**

The results of this study demonstrate the valuable contribution that agricultural science at secondary school level is making to agricultural literacy in that adolescents displayed a good knowledge of farming generally as well as understanding some of the challenges facing farmers, e.g. market volatility and environmental concerns. This is especially important within the context of increasing urbanisation globally. The growing interest in the subject is positive in terms of the public image and understanding of farming realities and in reaching counter-stereotypical students including young women, and those from non-farming and urban backgrounds. The level of interest in the subject could be further leveraged to engage

and support students who might consider careers in agriculture and who may not be aware of the opportunities in primary agriculture. Generational renewal needs to open up to both familial and non-familial succession routes on farms to secure food production for future generations as well preventing the decline of rural communities (Connolly *et al.*, 2012).

What emerged from the focus groups in this study is that young people who are studying agricultural science in school are forming their own views about the farming sector including environmental sustainability as well as economic viability and a sense that the age structure is too old to make it an attractive career. As a consequence of the aging farm structure, the sector appears to have lost the connection with the younger generation, failing to engage them in building and shaping a sector to meet their future needs. Gender and birth order are the traditional modes of successor identification but a gradual shift to consider new modes has started (Chiswell & Lobley, 2015) and there is scope for extension agencies to promote and facilitate these non-traditional succession stories. The sector needs to find space to engage with young people and provide them with chances to voice their concerns through debate and dialogue as well as allow them the opportunity to influence and shape the sector. In doing this, the sector will enable young people to create an industry that they identify with and feel part of which in turn may see an increasing number pursuing careers in farming. At a minimum, it will improve agricultural literacy among adolescents as well as their families and communities allowing for a more informed view of the sector.

The students also identified the positive role that dairy farmers play regarding food production and security but at the same time expressed ethical concerns about farming. Similarly, other research found that consumers have become increasingly engaged in how their food is produced (O'Callaghan *et al.*, 2016; Faulkner *et al.*, 2018) and people's acceptance of modern-day dairy farming is related to what they find important in life (Boogaard *et al.*, 2011). Boogaard *et al.* (2011) found that knowledge and experience of farming positively affected people's image of farming highlighting the importance of agricultural literacy in societies. Horan & Roche (2020) suggested that food producers should respond to the citizens' concerns by providing additional information on the origins and social and environmental practices employed within supply chains.

### **Key influencers**

Similar to Matthews & Falvey (1999) and Beecher *et al.* (2019), parents are key influencers on adolescents regarding career choice and ideally they provide a supportive environment in which career choices can be explored. In a supportive environment, interests are a good predictor of the types of choices (Lent *et al.*, 1994) and in this study, interest

in the subject was the primary reason adolescents studied agricultural science. Subject teachers influence students' perceptions of careers (Christidou, 2011; Byrne *et al.*, 2012; Hearne & Galvin, 2015); therefore, agricultural science teachers play an important role in nurturing students' interest in a career in farming particularly if they are female and from a non-farming background. Further research should investigate the perceptions of agricultural science teachers and guidance counsellors towards careers in dairy and other forms of primary production and determine the level and type of influence they have in encouraging students to pursue farming careers.

### **Implications**

The agricultural science curriculum aims to inform students about the variety of careers in dairy farming but career choice is a complex topic and a dynamic process (Leavy & Smith, 2010). Students in this study displayed a good knowledge of the different careers available but also indicated the wide variety of careers outside of agriculture that they would like to pursue. Given the negative image and perception of dairy farming careers, it would be important that students are given the opportunity to explore and gain practical experience of agricultural careers so that they can consider its potential for themselves. This practical experience of dairy farming triggered an interest for some of the students from non-farming backgrounds to study agricultural science. One option to consider is the inclusion of career and employment role models into the curriculum to allow for a facilitated discussion about careers. The lively and energetic debate that was observed during the focus groups suggests that this is something the students would engage with enthusiastically. The fostering of self-efficacy and leadership ambitions through the use of role models is well recognised (Barnir *et al.*, 2011; Nesse & Bhatta, 2018). It is important that a variety of role models are selected to disrupt the perception that farming is only a hobby or part-time career, that you need to be male and from a farm to be a farmer (Beecher *et al.*, 2019; Cassidy, 2019). Leavy & Smith (2010) suggested that a lack of professional role models might be one reason contributing to the lower educational aspirations of young people in rural areas. The findings of this study and those of Robnett & Leaper (2013) suggest that the promotion of successful female farmers as role models for young women is of particular importance to disrupt the norm of gender role stereotypes among female friendships groups. Helping women develop strong identities and interests related to agriculture is a potential opportunity to address under-representation in farming careers. For women aspiring to a career in a non-traditional field, same gender role models are particularly important (Quimby & DeSantis, 2006; Drury *et al.*, 2011; Young *et al.*, 2013). Even brief exposure to just one such role model could enhance female students' self-efficacy beliefs and determination to succeed in

domains where women are under-represented or negatively stereotyped (Olsson & Martiny, 2018). When it comes to careers in farming, personal role models and professionals employed in agriculture were important influences in students' choice on a career in agriculture (Wildman & Torres, 2001).

Although the groups were samples of convenience where participants were classmates, young people often hesitate to talk to each other in focus groups (Adler *et al.*, 2019) especially about sensitive topics such as gender stereotypes. This was taken into consideration when designing the focus groups. Adler *et al.* (2019) noted that there is a dearth of literature regarding focus group methodologies with adolescents but acknowledged that successful focus groups integrate seeing, touching and moving about and use interactive activities to engage and stimulate discussion. Therefore, the interactive activities employed in the present study (ice-breaker, creating a collage and listing careers) follow the recommendations of Adler *et al.* (2019) to engage adolescents and stimulate discussion, which would be difficult to achieve in a one-to-one interview (Wilkinson, 1998). The activities resulted in a good-humoured discussion and provided a more fully articulated account of how adolescents viewed careers in dairy farming. Therefore, future research using focus groups should include several interactive activities to overcome adolescents' insecurities and encourage free flowing conversations and debates. Such activities could also be used with the wider population particularly when sensitive topics are to be discussed and/or when the groups are unfamiliar with each other.

### **Conclusion**

This study provides additional information towards understanding the perceptions of agricultural science students towards careers in dairy. The findings have implications for strategies and interventions that can potentially be used to help support participation in agricultural careers among diverse students and point to the important role that agricultural curriculum and teachers play in forming career aspirations of adolescents. The findings point to the opportunities to influence the perceptions of agricultural science students, particularly counter-stereotypical students including young women, and those from non-farming backgrounds towards dairy farming careers. The students had both positive and negative ideas about dairy farming careers which the industry should address to attract more young people into the industry. A gradual transition in farming occupational identities from a highly masculine, outdoor physical labour to a more business-like masculinity is occurring within the Irish dairy industry (Deming *et al.*, 2019) but many agricultural science students are yet to recognise this. A challenge for the industry is to get young people excited about farming and educate them about what a

modern, challenging career it can be and how it can align with their career aspirations. The agricultural science curriculum provides an opportunity to allow students to explore careers through classroom discussion, ideally with a variety of role models employed in various agricultural careers.

### Conflicts of interest

No potential conflict of interest was reported by the authors.

### Funding

This work was supported by Dairy Levy Trust [MKLS0161].

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