Department for Environment Food & Rural Affairs

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Greenhouse gas mitigation practices - England
Farm Practices Survey 2016

This release contains the results from the February 2016 Farm Practices Survey which focused on practices relating to greenhouse gas mitigation. The key results from the survey are given below.

Nutrient management (section 1)

Nutrient Management Plans help farmers and growers to plan the use of fertilisers and manures, meet regulatory demands and protect the environment. The proportion of holdings with a nutrient management plan has decreased to 55% in 2016 compared to 60% in 2015. Those holdings with nutrient management plans in 2016 accounted for 72% of the farmed area.

In 2016, the largest proportion of nutrient management plans was created by farmers themselves either with the help of a professional (46%) or without advice (23%). Three quarters of plans are updated annually and almost all farmers (93%) refer to their plan at least once a year.

Anaerobic digestion (section 2)

Anaerobic digestion is a treatment that composts waste in the absence of oxygen, producing a biogas that can be used to generate electricity and heat. Approximately 4.7% of holdings currently process slurries, crops or other feedstocks by anaerobic digestion either on their farm or elsewhere. Although this is a small proportion of farms, this has increased from just 1.5% in 2014.

Emissions (section 3)

In 2016, just under half of farmers (48%) attached some importance to considering greenhouse gases (GHGs) when taking decisions about their land, crops and livestock. This shows little change from 52% of holdings in 2015. Of the holdings currently taking action to reduce GHG emissions from their farm, recycling waste materials (87%) was the most frequently selected action followed by improving energy efficiency (79%).

Fertiliser, manure and slurry spreaders (section 4)

In 2016, 76% of farmers spread manure or slurry on their grassland or arable crops either themselves or hiring a contractor to do so and 85% spread fertiliser. Of those farmers spreading some or all of the manure or slurry themselves, under a half (46%) never calibrate their spreader.

Farm collaboration (section 5)

In 2016, the most popular forms of farm collaboration were membership of trade unions (61%), membership of buying groups (33%) and membership of discussion groups (30%).

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Note: The results in sections 6 to 9 relate only to holdings with livestock.

Manure and slurry storage (section 6)

In 2016, just over two thirds of holdings (67%) with livestock had storage facilities for solid manure in temporary heaps in fields. Almost a quarter of farmers store their slurry in a tank, whilst 14% store slurry in lagoons. At 58% most farmers have 4 to 6 month storage capacity for slurry on their farms.

Farm health planning and biosecurity (section 7)

In 2016, 63% of livestock holdings had a farm health plan. Of those holdings with a plan, 74% completed it with the assistance of a vet or adviser and 84% use their plan either routinely or when possible during the year to inform decisions on disease management. Just under half (46%) of livestock farmers undertake training for animal health and welfare and disease management.

Grassland and grazing (section 8)

In some situations sowing grassland with a clover mix or high sugar grasses can be a cost-effective method of increasing production and improving environmental protection. In 2016, 74% of livestock holdings had sown some or all of their temporary grassland with a clover mix and 57% have sown their temporary grassland with high sugar grasses.

Just less than three quarters of farmers always take action to reduce stocking rates when fields are excessively wet and almost two thirds routinely try to keep livestock out of water courses.

Livestock feeding regimes and breeding practices (section 9)

In 2016, 53% of livestock farmers indicated they use a ration formulation programme or expert nutritional advice when planning the feeding regime of their cattle and sheep at least some of the time. This has remained unchanged since 2013.

Just under a quarter of livestock holdings offered alternative forages (other than grazed or conserved grass) to their livestock. Whole-crop silage and maize were the most common forages offered by 13% and 10% of farmers respectively.

Estimated Breeding Values (EBV) provide an estimate of the genetic worth of animals using desirable traits such as meat production. The proportion of holdings using bulls or rams with a high EBV when breeding beef cattle or lambs in 2016 is 61% and 52% respectively.

Survey methodology (pages 36 – 37)

Details on how the survey is run, availability of results and data uses can be found in the methodology section as the end of this document.

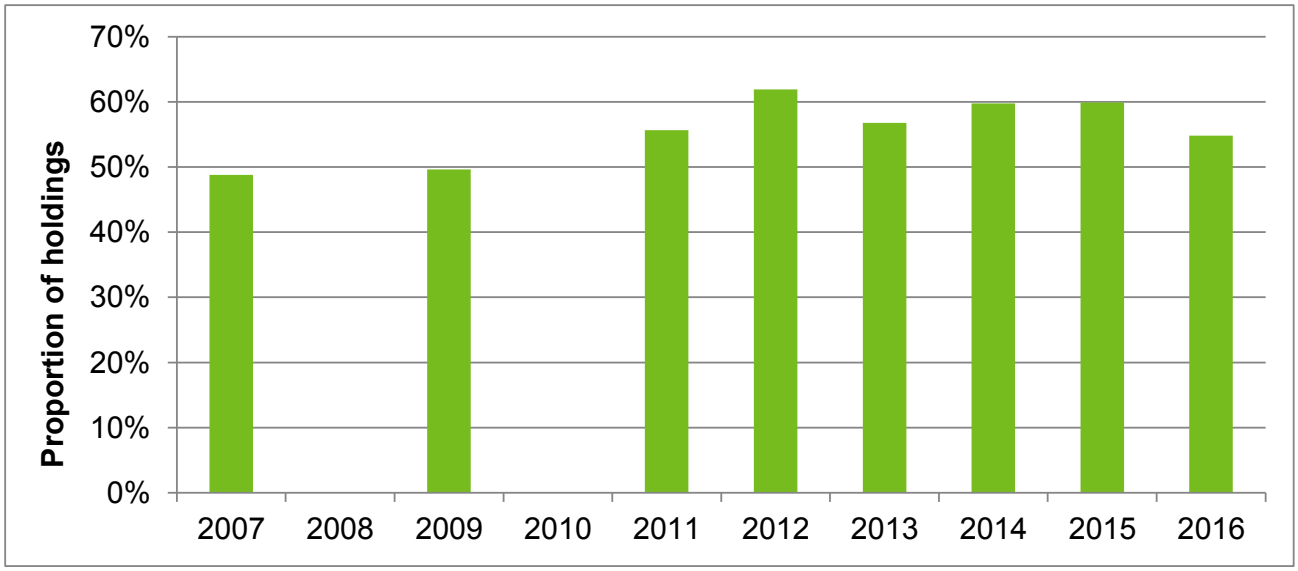
Section 1. Nutrient management

Effective nutrient management provides sufficient nutrients to meet the growth requirements of crops and grassland whilst managing environmental impacts; it can help minimise GHG emissions, reduce the incidence of diffuse water pollution and increase productivity by reducing input costs. Here we consider how farmers manage the application of fertilisers and manures, the use of nutrient management plans and how nutrient requirements are calculated and monitored.

Key findings

- In 2016, 55% of holdings had a nutrient management plan which is the lowest level since 2009. These holdings accounted for 72% of the farmed area covered by this survey.
- The largest proportion of nutrient management plans were created by farmers themselves either with the help of a professional (46%) or without advice (23%). The remaining 31% were created by an adviser or contractor.
- In 2016, 69% of farmers have a programme of soil testing for nutrient indices and 74% for pH. Of these holdings almost all were testing at least some of their fields every five years.
- Some 62% of holdings have a manure management plan for their farm. This is almost unchanged from 2015.
- 36% of farmers keep track of soil organic matter and 75% of farmers know the soil types for each field on their farm.

Figure 1.1: Proportion of holdings with a nutrient management plan: 2007 – 2016



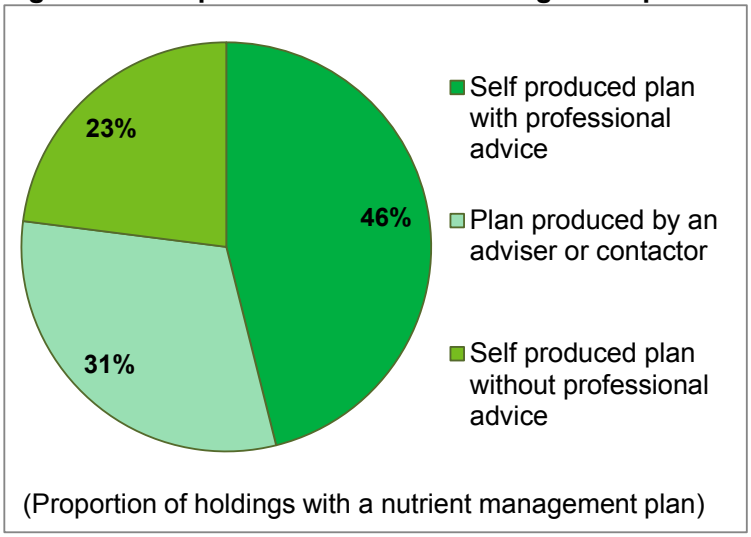
This question was not asked in 2008 and 2010, therefore results are not available for these years.

The proportion of farms with a nutrient management plan (NMP) has decreased from 60% in 2015 to 55% in 2016 (Figure 1.1). In 2016, those holdings with nutrient management plans accounted for 72% of the farmed area.

Around 13% of holdings (accounting for 8% of the farmed area) indicated that a NMP is not applicable. This figure varied by farm type with 30% of pig/poultry farms, 21% of lowland grazing

livestock farms and 20% of LFA grazing livestock farms indicating that a NMP was not applicable compared to 7% of other general cropping farms and 4% of dairy farms and cereal farms.

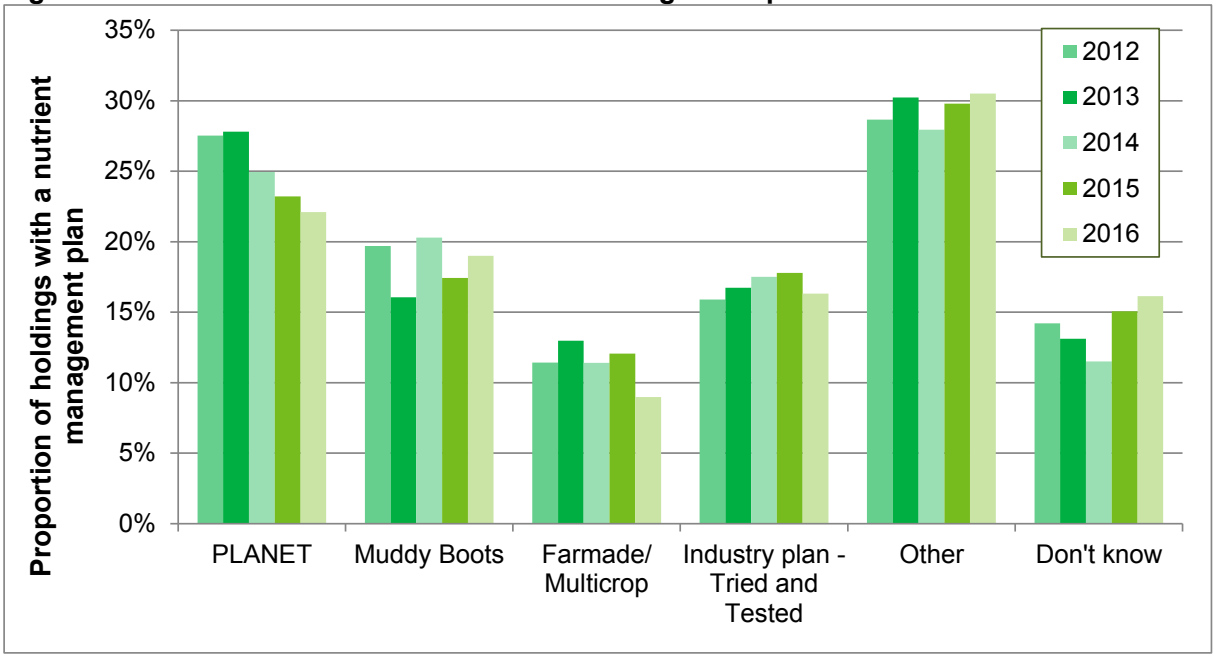
Figure 1.2: Preparation of nutrient management plans: 2016



In 2016, 23% of those with a nutrient management plan completed the plan on their own without advice, whilst a further 46% created it themselves with the help of an adviser (Figure 1.2). The remaining 31% had the plan produced by a contractor or adviser.

Of those that sought professional advice, the majority (86%) did so from fertiliser advisers or agronomists (Table 1.3). Most of those with a nutrient management plan update it every year (77%) and almost all (93%) refer to it at least once each year (Tables 1.4 and 1.5).

Figure 1.3: Methods used to create nutrient management plans: 2012 – 2016



PLANET, Muddy Boots, Farmade/Multicrop and Tried & Tested are methods for creating nutrient management plans. PLANET has been the most popular of these four methods (Figure 1.3), although in each of the last five years the largest proportion of farmers (31% in 2016) have used other methods not listed on the survey form to create their plans (Table 1.6). 'Defra recommendations (RB209) was the most commonly reported source of nutrient recommendations for plans (Table 1.7).

The percentage of farmers undertaking some form of nutrient testing on soil has remained similar between 2009 and 2016. Results for the past three years can be found in table 1.8. Approximately 62% of farms have a manure management plan in 2016, almost unchanged since 2015. The

majority of farmers (91%) use nutrient recommendations for manure management plans from Defra recommendations (RB209, CoGAP).

Soil Monitoring has been introduced this year to look at the use of soil organic matter and whether this is being recorded. Organic matter helps to retain nutrients and water in soil. Benefits include reduced compaction and surface crusting, plus improved water infiltration into the soil.

In 2016 36% of farmers kept track of soil organic matter on their farm. Of those not keeping track 45% provided the main reason as not important enough to test for. (Table 1.13 and 1.14)

Figure 1.4: Reasons preventing monitoring soil organic matter 2016:

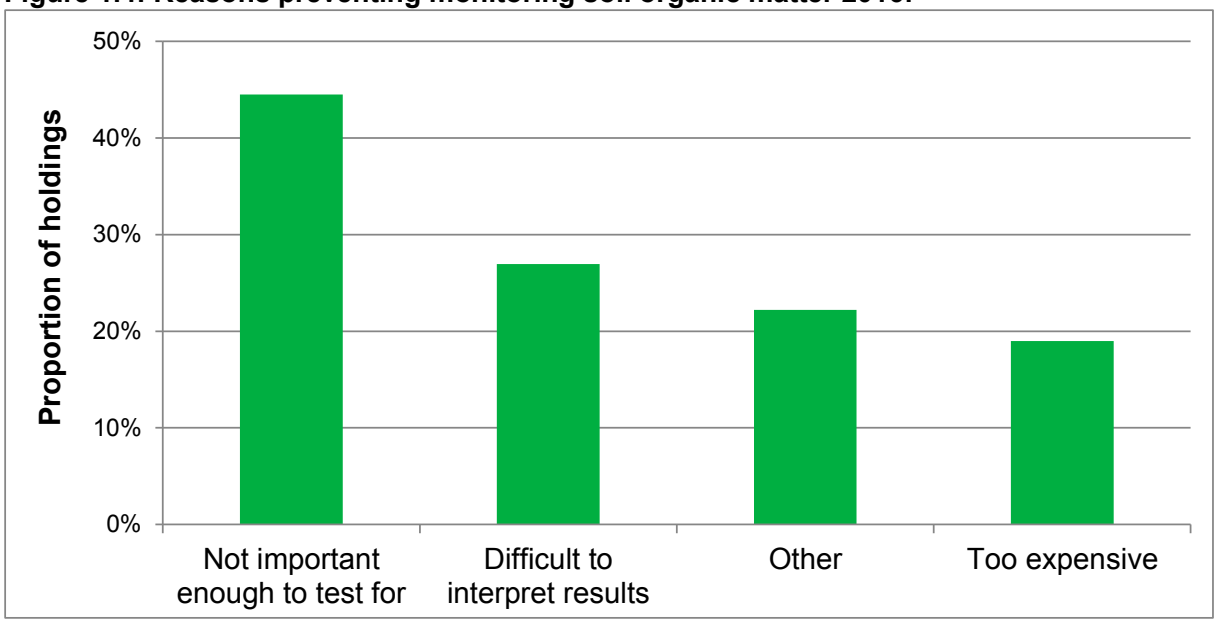


Table 1.1: Uptake of nutrient management plans: 2012 – 2016 (proportion of holdings and farmed area)

	2012		2013		2014		2015		2016	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
% of holdings										
Yes	62	±3	57	±2	60	±2	60	±2	55	±2
No	29	±3	33	±2	32	±2	29	±2	32	±2
Not applicable	9	±2	10	±2	8	±1	11	±1	13	±2
% of farmed area										
Yes	78	±3	73	±2	74	±2	76	±2	72	±2
No	18	±2	21	±2	22	±2	19	±2	20	±2
Not applicable	5	±2	6	±1	4	±1	6	±1	8	±2

Based on 1 146 responses in 2012, 2 058 in 2013, 2 481 in 2014, 2 635 in 2015 and 2 206 in 2016 from holdings with a nutrient management plan.

Table 1.2: Use of advisers/professional advice to create nutrient management plans: 2013 – 2016 (proportion of farmers with nutrient management plans)

	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Self-produced plan without professional advice	25	±3	22	±2	25	±2	23	±2
Self-produced plan with professional advice	48	±3	43	±3	45	±3	46	±3
Plan produced by an adviser or contractor	27	±3	35	±3	30	±2	31	±3

Based on 1 348 responses in 2013, 1 651 in 2014, 1 782 in 2015 and 1 432 in 2016 from holdings with a nutrient management plan.

Table 1.3: Use of advisers and contractors for completion of nutrient management plans: 2016

	Those who sought an adviser's help to create the plan themselves [(a)]		Those whose plan was created by an adviser or contractor[(b)]	
Type of adviser	% of holdings	95% CI	% of holdings	95% CI
Fertiliser adviser / agronomist	86	±3	83	±4
Animal nutritionist	7	±2	4	±2
FWAG [(c)]	1	±1	2	±1
Other	10	±3	14	±4

(a) Based on 684 responses from those who created the nutrient management plan themselves with advice.
(b) Based on 429 responses from those whose nutrient management plan was created by an adviser or contractor.
(c) FWAG: Farming and Wildlife Advisory Group.

Table 1.4: Frequency with which the nutrient management plan is updated: 2013 – 2016

	2013		2014		2015		2016	
Frequency of update	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Every year	79	±3	76	±2	75	±2	77	±2
Every 2 years	10	±2	10	±2	11	±2	9	±2
Every 3 years or longer	11	±2	13	±2	14	±2	14	±2

Based on 1 346 responses in 2013, 1 647 in 2014, 1 780 in 2015 and 1 430 in 2016 from holdings with a nutrient management plan.

Table 1.5: Frequency with which the nutrient management plan is referred to in a year: 2013 – 2016

Frequency of use	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
More than 10 times	8	±*1*	9	±*1*	9	±*1*	8	±1
5 to 10 times	18	±*2*	18	±*2*	16	±*2*	16	±2
Less than 5 times	67	±*3*	68	±*2*	68	±*2*	70	±3
Never	6	±*1*	6	±*1*	6	±*1*	7	±2

Based on 1 345 in 2013, 1 649 in 2014, 1 778 in 2015 and 1 428 in 2016 from holdings with a nutrient management plan.

Table 1.6: Methods used to create nutrient management plans: 2013 – 2016

Method	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
PLANET	28	±*3*	25	±*2*	23	±*2*	22	±2
Muddy Boots	16	±*2*	20	±*2*	17	±*2*	19	±2
Farmade / Multicrop	13	±*2*	11	±*2*	12	±*2*	9	±1
Industry plan – 'Tried and Tested'	17	±*2*	18	±*2*	18	±*2*	16	±2
Other	30	±*3*	28	±*2*	30	±*2*	31	±3
Don't know	13	±*2*	12	±*2*	15	±*2*	16	±2

Based on 1 348 responses in 2013, 1 643 in 2014,1 775 in 2015 and 1 421 in 2016 from holdings with a nutrient management plan.

Table 1.7: Sources of nutrient recommendations for nutrient management plans: 2013 – 2016

	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Defra recommendations / manual (RB209)	70	±*3*	68	±*3*	68	±*2*	65	±3
An adviser's or industry note	38	±*3*	36	±*3*	36	±*2*	36	±3
Personal experience	43	±*3*	41	±*3*	40	±*3*	40	±3
Other	4	±*1*	3	±*1*	4	±*1*	3	±1
Don't know	4	±*1*	2	±*1*	3	±*1*	4	±1

Based on, 1 348 responses in 2013, 1 651 in 2014, 1 780 in 2015 and 1 430 in 2016 from holdings with a nutrient management plan.

Table 1.8: Nutrient testing of soil: 2014 – 2016

		2014		2015		2016	
		Proportion	95% CI	Proportion	95% CI	Proportion	95% CI
Testing the nutrient content (indices) of soil[(a)]	% of holdings	70	±2	71	±2	69	±2
	% of farmed area	83	±2	85	±1	84	±2
Testing the pH of soil[(a)]	% of holdings	74	±2	75	±2	74	±2
	% of farmed area	84	±2	87	±1	86	±2

Based on responses from holdings considering the questions applicable. Minimum numbers of responses used: 2 375 in 2014, 2 477 in 2015 and 2 079 in 2016.
(a) The questions used to collect this data were worded differently from 2014 onwards, so the differences seen between previous years may be due to these changes. Prior to 2014 the question was worded to ask whether farmers regularly tested the nutrient content and pH of soil 'at least every 5 years'. From 2014 the question was split to initially ask if farmers carried out soil testing and then whether they tested all fields, some fields or no fields at least every 5 years. The additional detail relating to the number of fields tested regularly in 2016 can be found in table 1.9.

Table 1.9: Nutrient testing of soil by proportion of fields: 2016

		All fields		Some fields		None of the fields	
		Proportion	95% CI	Proportion	95% CI	Proportion	95% CI
Testing the nutrient content (indices) of soil at least every 5 years	% of holdings	57	±3	42	±3	0.6	±0.5
	% of farmed area	64	±3	36	±3	0.4	±0.3
Testing the pH of soil at least every 5 years	% of holdings	55	±3	44	±3	0.7	±0.5
	% of farmed area	61	±3	39	±3	0.3	±0.3

Based on responses from holdings with a programme of soil testing for either nutrient indices or pH. Minimum numbers of responses used: 1 602 in 2016.

Table 1.10: Nutrient testing of manure: 2015 - 2016

Methods of testing/assessing/calculating nutrient content of manure	2015		2016	
	% of holdings	95% CI	% of holdings	95% CI
Sampling and lab analysis	14	±1	13	±2
Sampling and on-farm testing	3	±1	3	±1
Based on published tables	37	±2	33	±2
No testing done	47	±2	50	±2

Based on 2 140 responses in 2015 and 1 756 in 2016 from holdings without a manure management plan.

Table 1.11: Uptake of manure management plans: 2013 – 2016

	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
% of holdings	71	±3	64	±2	63	±2	62	±2
% of farmed area	82	±2	77	±2	76	±2	77	±3

Based on 1 570 responses in 2013, 2 134 in 2014, 2 299 in 2015 and 1 871 in 2016 from holdings for which the question was applicable.

Table 1.12: Source of nutrient recommendations for manure management plans: 2013 – 2016

	2013		**2014**		**2015**		**2016**	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Defra recommendations / manual (RB209), CoGAP	87	±2	90	±2	89	±2	91	±2
Other	16	±2	12	±2	14	±2	11	±2

Based on 1 206 responses in 2013, 1 537 in 2014, 1 622 in 2015 and 1 320 in 2016 from holdings with a manure management plan.

Table 1.13: Soil organic matter and awareness of soil types: 2016

	2016	
	% of holdings	**95% CI**
Holdings keeping track of soil organic matter	36	±3
Holdings who know the soil type[(a)] for each field on the farm	75	±3

Based on no fewer than 1 465 responses in 2016.
(a) as described in Appendix 1 of Defra Recommendations/Manual (RB209)

Table 1.14: Reasons preventing farmers keeping track of soil organic matter: 2016

	2016	
	% of holdings	**95% CI**
Too expensive	19	±3
Not important enough to test for	45	±4
Difficult to interpret results	27	±3
Other	22	±3

Based on 923 responses in 2016 from holdings that do not keep track of soil organic matter

Section 2. Anaerobic digestion

Anaerobic digestion is a natural process in which plant and animal materials are broken down by micro-organisms in the absence of oxygen, producing a biogas that can be used to generate electricity and heat. The process allows more efficient capture and treatment of the nutrients and greenhouse gas emissions from animal slurries and manures than can be achieved by spreading directly onto land. The remaining digestate is rich in nutrients and can be used as fertiliser. This section looks at the proportion of farmers who are currently processing any waste or crop feedstocks in this way.

Key findings

- In 2016, 4.7% of farmers said they process waste by anaerobic digestion. This is a slight decrease compared to 5.0% in 2015.
- Crops were the most common material type being processed, with 3.0% of farmers choosing this option. Slurries were the next most popular option processed by 2.6% of farmers.

The majority of farms do not currently process slurries, crops or other feedstocks by anaerobic digestion, with just 4.7% of holdings doing so in 2016. However this is an increase when compared to the 1.5% of farmers using anaerobic digestion in 2014. Prior to 2015, the number of farmers processing by anaerobic digestion had previously remained stable at approximately 1.5% (Table 2.1).

Table 2.1: Proportion of holdings processing waste by anaerobic digestion: 2012 – 2016

				% of holdings		95% CI
Waste type	2012	2013	2014	2015	2016	2016
Slurries	0.4	0.6	0.9	2.4	2.6	± *0.7*
Crops	0.4	0.6	0.8	3.2	3.0	± *0.8*
Other feedstocks from the holding	0.5	0.5	0.2	0.8	0.5	± *0.3*
Other feedstocks from outside the holding	0.6	0.1	0.3	0.5	0.7	± *0.4*
Any of the above	1.4	1.3	1.5	5.0	4.7	± *1.0*

Based on 1 144 in 2012 from holdings who had heard of anaerobic digestion and 2 049 responses in 2013, 2 470 in 2014, 2 641 in 2015 and 2 235 in 2016 from all holdings.

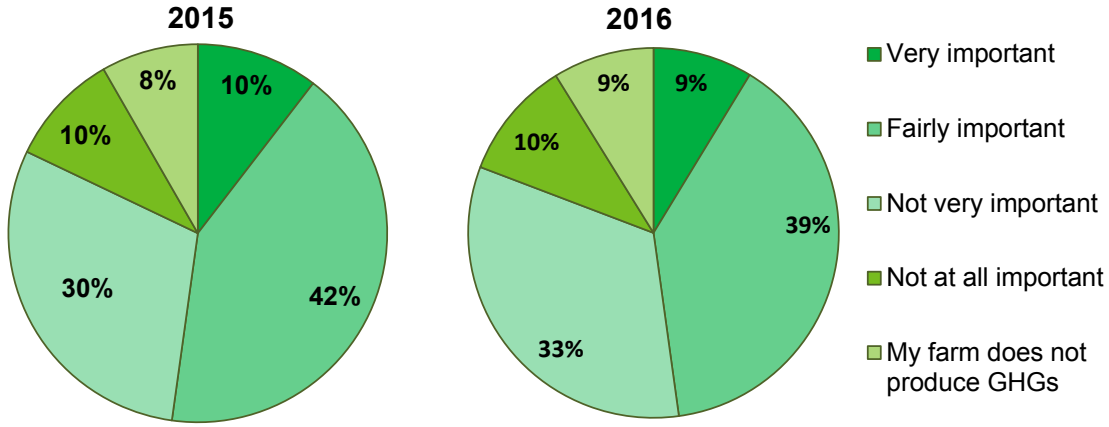
Section 3. Emissions

This section looks at the importance farmers place on greenhouse gas (GHG) emissions when making decisions about their farms. It also focuses on the actions that farmers are currently taking to reduce emissions and their motivations for doing so. In contrast we also look at the reasons that prevent farmers from taking action.

Key findings

- Almost half of farms (48%) in 2016 considered it fairly or very important to consider greenhouse gases (GHG) when taking decisions about their land, crops and livestock. This shows little change from 52% in 2015.
- In 2016, 57% of farmers reported that they were currently taking action to reduce greenhouse gas emissions from their farm. The most common actions taken by this group were recycling of waste materials from the farm (87%), improving energy efficiency (79%) and improving nitrogen fertiliser application accuracy (71%).
- The most common motivation for taking any action was that it was considered to be good business practice to do so. This has been the case for the past four years.
- For those not taking action to reduce GHG emissions, the most common reason given was that it was not necessary because their farm did not produce many emissions.

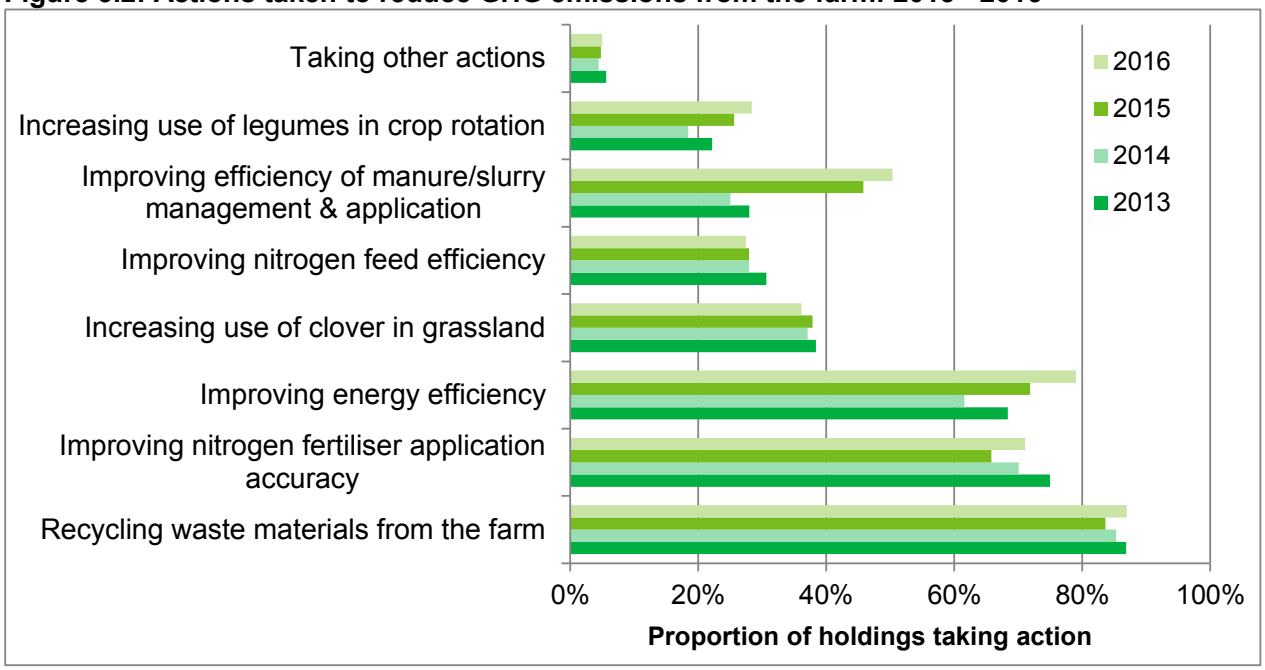
Figure 3.1: Importance placed on GHGs by farmers when taking decisions about their land, crops and livestock: 2015 – 2016



Almost half of farms (48%) considered it fairly or very important to consider greenhouse gases (GHG) when taking decisions about their land, crops and livestock in 2016. This shows little change from 52% in 2015 (Figure 3.1). There were 9% of farms that believed that their farm did not produce any GHGs.

57% of farmers said that they were currently taking action to reduce GHG emissions from their farm. Of those taking action (Figure 3.2 and Table 3.3) the three most common actions are recycling waste materials from the farm (87%), improving energy efficiency (79%) and improving nitrogen fertiliser application accuracy (71%). The largest change in actions seen between 2013 when these questions were first asked and 2016 was an increase in the number of farmers improving efficiency of their manure & slurry management and application. This rose from 28% of holdings in 2013 to 50% in 2016.

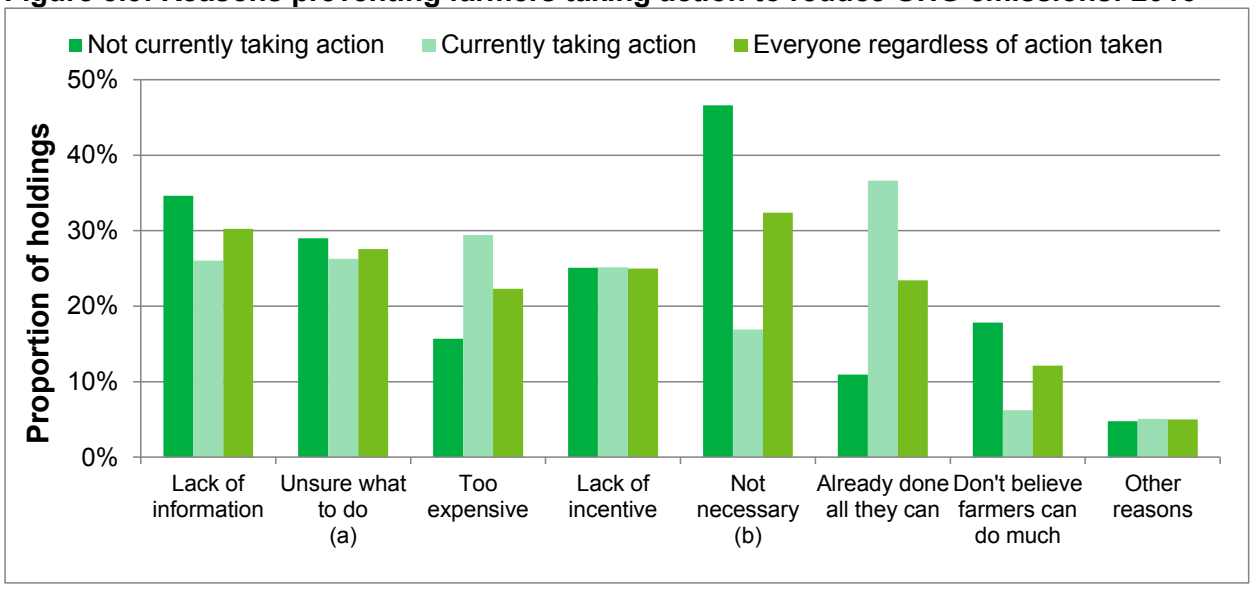
Figure 3.2: Actions taken to reduce GHG emissions from the farm: 2013 - 2016[(a)]



(a) Figures relate only to those holdings currently taking action to reduce GHG emissions from their farm.

For those farmers currently taking action to reduce their farm's GHG emissions the most common motivation for doing so was that it was considered to be good business practice (selected by 85% of holdings) followed by concern for the environment (selected by 63%) (Table 3.4).

Figure 3.3: Reasons preventing farmers taking action to reduce GHG emissions: 2016



(a) Unsure what to do - too many conflicting views on the issue
(b) Not necessary - don't believe farm produces many emissions

As might be expected, the reasons given that prevent people from taking action to reduce GHG emissions varied depending on whether farmers were currently taking action or not (Figure 3.3). For those not currently taking action, the most commonly quoted reason was that farmers did not think it was necessary to do so as the farm did not produce many emissions. For those who were already taking action the most commonly quoted reason was that farmers had already done all they can (37%), followed by expense (29%).

Table 3.1: Importance placed on GHGs by farmers when taking decisions about their land, crops and livestock: 2014 - 2016

	% of holdings			95% CI
	2014	2015	2016	2016
Very important	7	10	9	±*1*
Fairly important	39	42	39	±*2*
Not very important	34	30	33	±*2*
Not at all important	14	10	10	±*1*
Do not believe farm produces GHGs	7	8	9	±*2*

Based on responses from 2 474 holdings in 2014, 2 616 in 2015 and 2 203 in 2016.

Table 3.2: Belief that reducing GHG emissions from the farm will contribute to improving the overall profitability: 2014 - 2016

	% of holdings			95% CI
	2014	2015	2016	2016
Strongly agree	2	4	3	±*1*
Agree	37	41	38	±*2*
Disagree	52	48	51	±*2*
Strongly disagree	8	7	8	±*1*

Based on responses from 2 458 holdings in 2014, 2 586 in 2015 and 2 187 in 2016.

Table 3.3: Actions being taken to reduce GHG emissions from farms: 2014 - 2016

	% of holdings			95% CI
	2014	2015	2016	2016
Taking action[(a)]	59	61	57	±*2*
Of those taking action, the actions were[(b)]:				
Recycling of waste materials from the farm (e.g. tyres, plastics)	85	84	87	±*2*
Improving nitrogen fertiliser application accuracy	70	66	71	±*3*
Improving energy efficiency (e.g. reducing electricity use, using reduced tillage)	62	72	79	±*2*
Increasing use of clover in grassland	37	38	36	±*3*
Improving nitrogen feed efficiency, livestock diets	28	28	27	±*2*
Improving efficiency in manure and slurry management and application	25	46	50	±*3*
Increasing use of legumes in arable rotation	18	26	28	±*2*
Other actions	4	5	5	±*1*

(a) Based on responses from 2 461 holdings in 2014, 2 613 in 2015 and 2 198 in 2016.
(b) Based on responses from 1 566 holdings in 2014, 1 731 in 2015 and 1 405 in 2016 who are taking action to reduce GHG emissions.

Table 3.4: Main motivations for those taking action to reduce GHG emissions: 2014 - 2016

Motivations	% of holdings			95% CI
	2014	2015	2016	2016
Consider it good business practice	79	80	85	±2
Concern for the environment	59	62	63	±3
To improve profitability	53	55	55	±3
Regulation	47	46	45	±3
To meet market demands	19	19	19	±2
Other motivation	2	3	2	±1

Based on 1 564 responses in 2014, 1 727 in 2015 and 1 397 in 2016 from holdings who are taking action to reduce GHG emissions.

Table 3.5: Reasons preventing farmers from taking action to reduce GHG emissions from their farm: 2015 - 2016

	For those not taking action[(a)]			For those already taking action[(b)]			For all holdings[(c)]		
	% of holdings			% of holdings			% of holdings		
	2015	2016	95% CI	2015	2016	95% CI	2015	2016	95% CI
Lack of information	26	35	±4	25	26	±3	26	30	±2
Too expensive	14	16	±3	30	29	±3	22	22	±2
Lack of incentive	19	25	±3	23	25	±3	21	25	±2
Already done all they can	12	11	±2	35	37	±3	24	23	±2
Don't believe farmers can do much	14	18	±3	6	6	±2	10	12	±2
Not necessary – don't believe farm produces many emissions	40	47	±4	15	17	±3	27	32	±2
Unsure what to do - too many conflicting views on the issue	30	29	±3	24	26	±3	27	28	±2
Other reasons	6	5	±2	5	5	±2	5	5	±1

(a) Based on responses from 871 holdings in 2015 and 777 holdings in 2016 who are not taking action to reduce GHG emissions.
(b) Based on responses from 1 233 holdings in 2015 and 927 holdings in 2016 who are currently taking action to reduce GHG emissions.
(c) Based on responses from 2 108 holdings in 2015 and 1 712 holdings in 2016 regardless of whether or not they are taking action to reduce GHG emissions.

Section 4. Fertiliser, manure and slurry spreaders

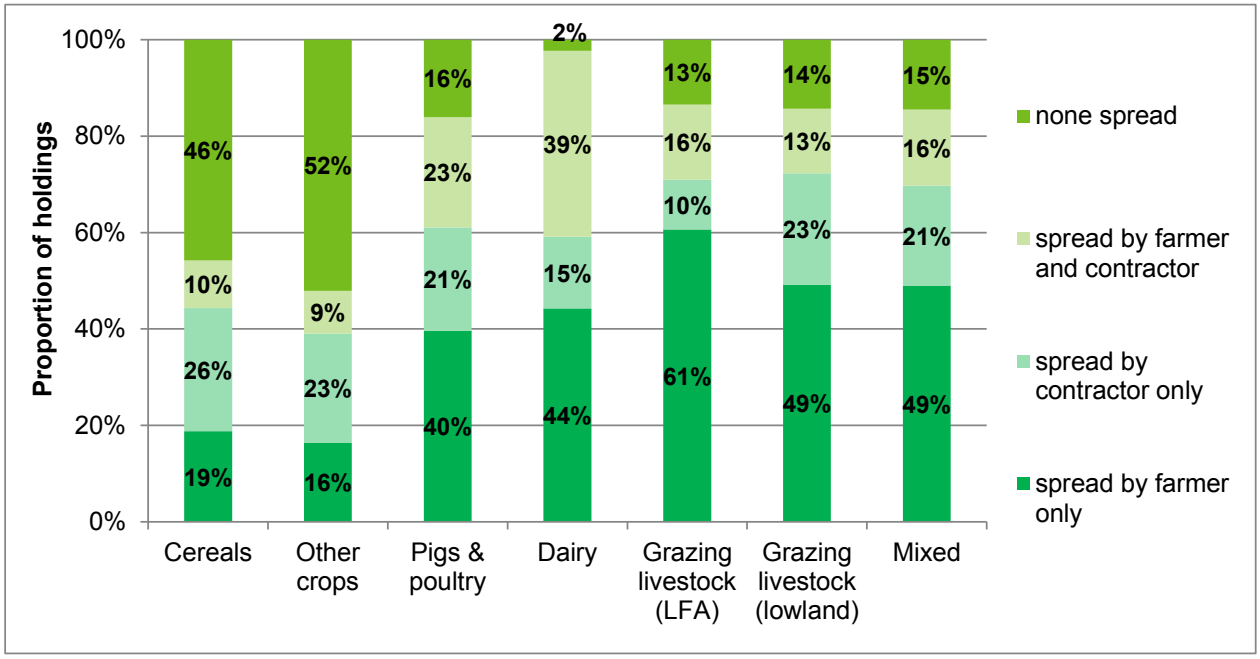
Calibrating fertiliser, manure and slurry spreaders can help to improve input efficiency and reduce GHG emissions. This section focuses specifically on farmers who spread manure, slurry and fertiliser.

More details on nitrogen fertiliser spreading practices are available in the British Survey of Fertiliser Practice at: https://www.gov.uk/government/collections/fertiliser-usage.

Key findings

- Just over three quarters of holdings (76%) spread manure or slurry on their grass or arable land in 2016 and 85% spread fertilisers.
- On (46%) of holdings where the farmer spreads at least some manure or slurry themselves, the manure or slurry spreader is never calibrated.

Figure 4.1: Proportion of holdings spreading manure and slurry on grassland and arable land by farm type: 2016



In 2016, 76% of holdings spread manure or slurry on their grass and arable land. As might be expected there was considerable variation between farm types. Almost all dairy farms spread manures or slurries and these farms are more likely to use contractors to spread at least some of the manure and slurry than other farm types. The majority (61%) of LFA grazing livestock farmers spread manure/slurry themselves only (Figure 4.1).

Fertiliser was spread either by the farmer or a contractor on 98% of cereal farms, 95% of other cropping farms and 93% of dairy farms. On all three of these farm types the largest proportion of holdings said the fertiliser was spread solely by the farmer, however cereal and other cropping farms were more likely to use a contractor than dairy farms (Figure 4.2).

Figure 4.2: Proportion of holdings spreading fertiliser on grassland and arable land by farm type: 2016

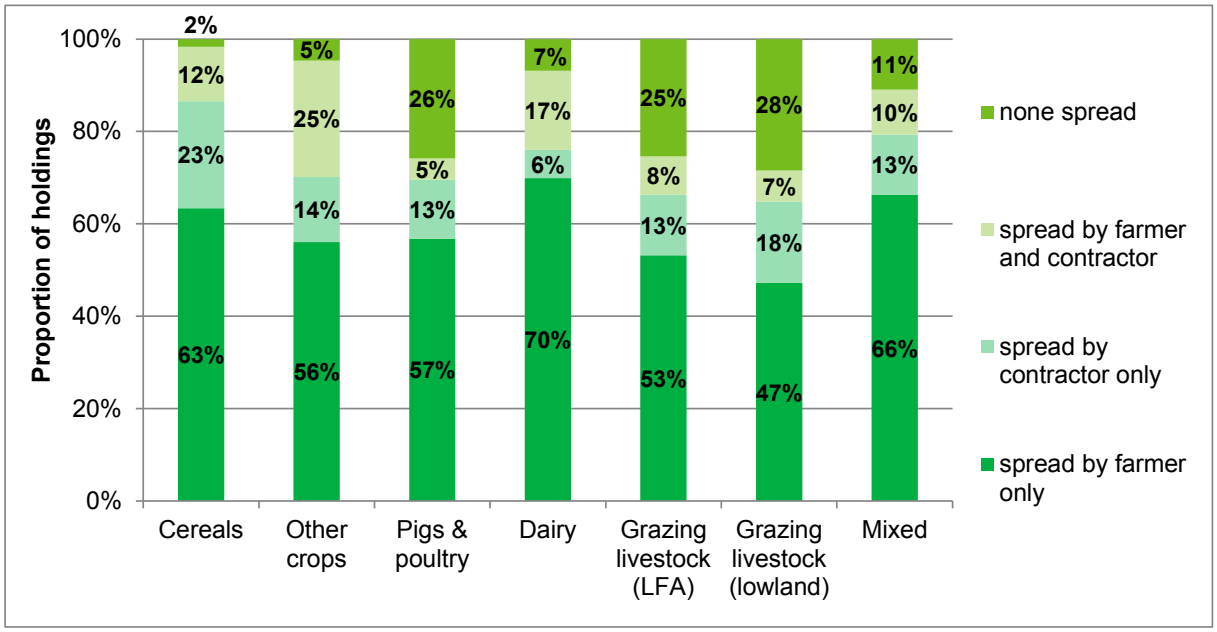


Table 4.1: Spreading of manure and slurry on grassland or arable land: 2014 - 2016

	2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Spread by farmer only	35	±2	40	±2	39	±3
Spread by farmer and also contractor	16	±1	15	±2	16	±2
Spread by contractor only	20	±2	22	±2	21	±2
None spread	29	±2	23	±2	24	±2

Based on 2 467 responses in 2014, 2 297 in 2015 and 1 911 in 2016.

Table 4.2: Spreading of fertiliser on grassland or arable land: 2015 - 2016

	2015		2016	
	% of holdings	95% CI	% of holdings	95% CI
Spread by farmer only	60	±2	58	±2
Spread by farmer and also contractor	11	±1	11	±1
Spread by contractor only	15	±2	16	±2
None spread	14	±2	15	±2

Based on 2 315 responses in 2015 and 1 951 in 2016.

Table 4.3: Frequency with which farmers calibrate their manure or slurry spreader(s): 2014 - 2016

Frequency of check	2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Never	64	*±3*	51	*±3*	46	±3
Whenever there is significant change in manure or slurry characteristics	24	*±2*	18	*±2*	18	±3
Whenever manure or slurry is tested	4	*±1*	2	*±1*	1	±1
Every year[(a)]	:	*:*	19	*±3*	21	*±3*
Less often than every year[(a)]	:	*:*	7	*±2*	9	*±2*
Other frequency	8	*±2*	3	*±1*	6	*±2*

Based on 1 343 responses in 2014, 1 100 in 2015 and 938 in 2016 on holdings where the farmer spreads some or all of the manure/slurry.
(a) These were new options added to the survey in 2015 so other categories are not directly comparable with previous years.
: data not collected.

Section 5. Farm collaboration

This section provides information on the extent and type of farm-to-farm services and collaborative activities that are currently practiced in England. The information collected will aid investigation into the opportunities and barriers to collaborative land-scape scale interventions necessary to achieve both productivity and environmental goals.

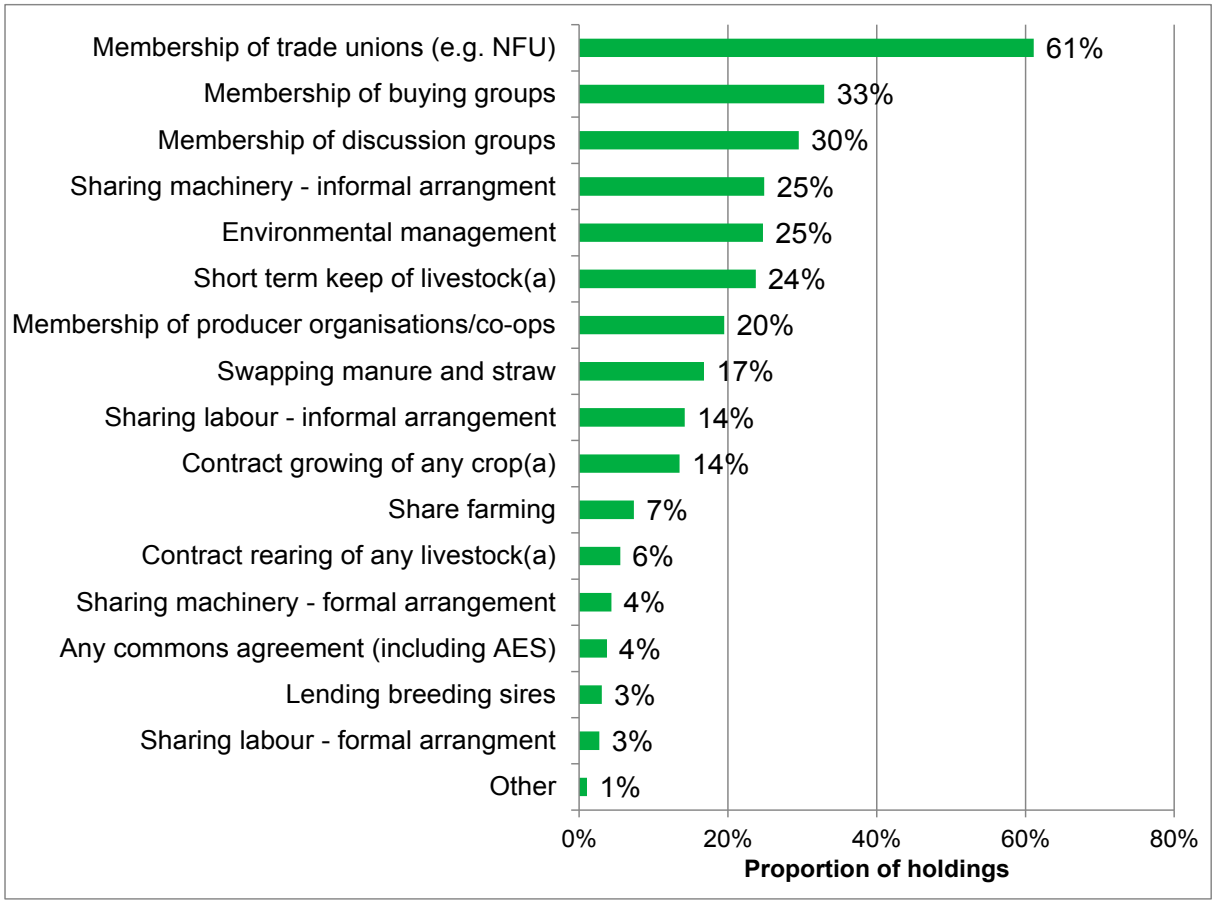
Key findings

- In 2016, the most popular form of farm collaboration was membership of trade unions (61%).
- Mixed farms are the most likely to informally share labour at 19%.

In 2016, the most popular forms of farm collaboration were membership of trade unions (61%), membership of buying groups (33%) and membership of discussion groups (30%) (Figure 5.1).

Where farms are sharing machinery or labour this was more likely to be done under an informal arrangement rather than a formal one (Table 5.1).

Figure 5.1: Proportion of holdings involved, either formally or informally, in any form of co-operation or joint working with other farmers: 2016



(a) for or by other farmers

Table 5.1: Proportion of holdings involved, either formally or informally, in any form of co-operation or joint working with other farmers: 2016

Type of farm collaboration	% of holdings	95% CI
Membership of buying groups	33	±2
Membership of discussion groups	30	±2
Membership of producer organisations/co-ops	20	±2
Membership of trade unions (e.g. NFU)	61	±3
Any commons agreement (including AES)	4	±1
Environmental management (e.g. joint agri-environment scheme agreement)	25	±2
Contract rearing of any livestock for or by other farmers	6	±1
Contract growing of any crop for or by other farmers	14	±2
Swapping manure and straw	17	±2
Lending breeding sires	3	±1
Share farming	7	±1
Sharing labour – informal arrangement	14	±2
Sharing labour – formal arrangement	3	±1
Sharing machinery – informal arrangement	25	±2
Sharing machinery – formal arrangement	4	±1
Short term keep of livestock for or by other farmers	24	±2
Other	1	±1

Based on 1 839 responses in 2016.

Note: **The results in sections 6 to 9 relate only to holdings with livestock.**

Section 6. Manure and slurry storage

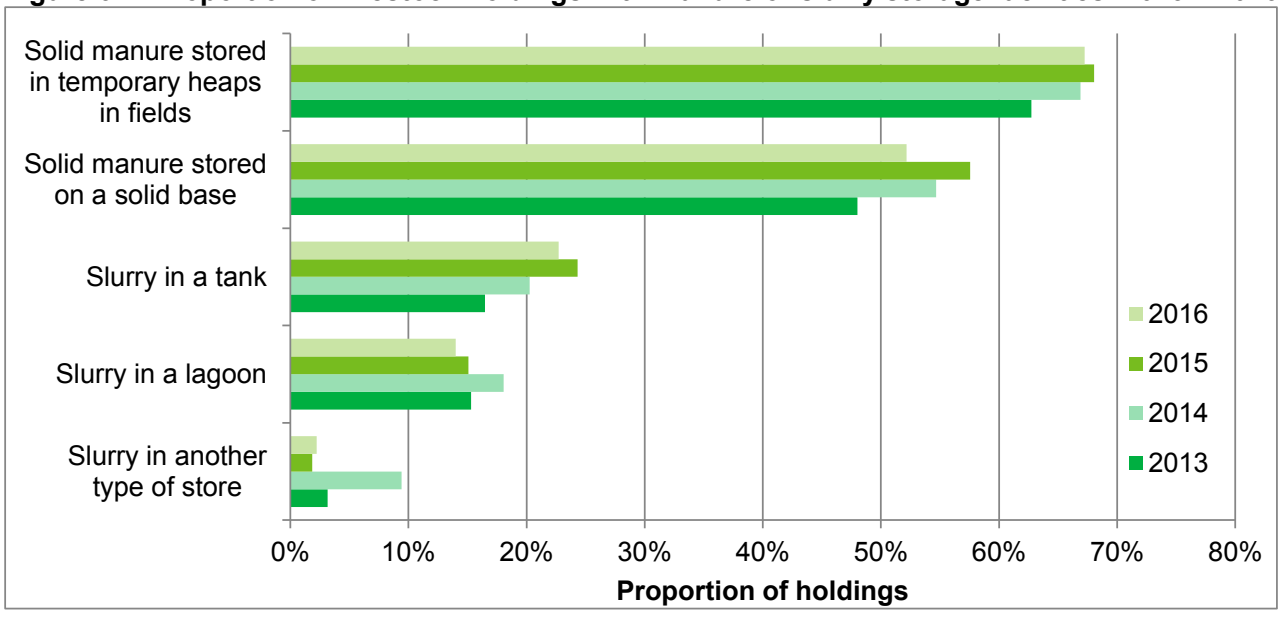
The system of manure and slurry management is relevant to the control of environmental risks to water and air. It prevents the loss of ammonia to the air, at the same time retaining the nitrogen for use as an organic fertiliser, reducing the need for manufactured nitrogen fertiliser inputs.

This section looks at the types of stores that livestock farmers have, whether or not they are covered, and whether the farmer has any plans to upgrade their current facilities. It also looks at whether the farmer has a slurry separator. Separating the suspended solids from slurry allows the two manure streams to be handled separately. The solid fraction can be stored on a concrete pad or in a field heap, while the liquid fraction can be stored and transported/pumped to fields for land application. Separation can reduce storage space and improve the efficiency with which nitrogen is applied to land which has the potential to reduce emissions.

Key findings

- Solid manure in temporary heaps remains the most common form of storage, with approximately two thirds of the farmers having this kind of store.
- Almost a quarter of farmers store their slurry in a tank, whilst 14% store slurry in lagoons.
- In 2016, 11% of livestock farmers with storage facilities intend to enlarge or upgrade their manure or slurry storage compared to 13% in 2015

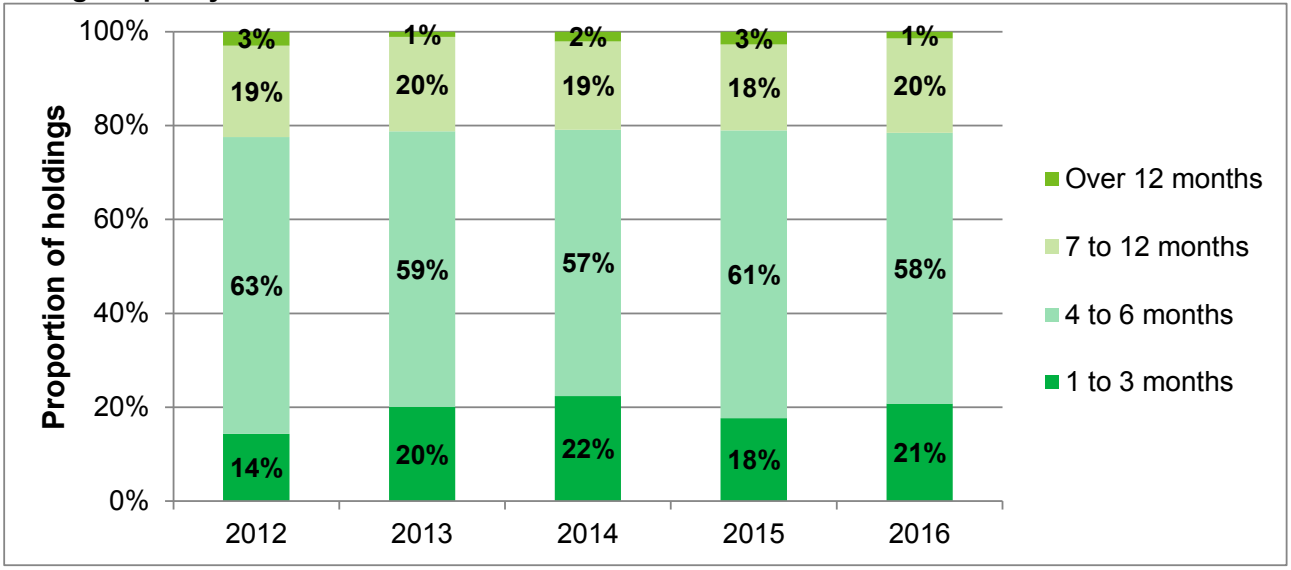
Figure 6.1: Proportion of livestock holdings with manure or slurry storage facilities: 2013 – 2016



The most common storage facility for solid manure continues to be temporary heaps in fields. The most common facilities for slurry storage are tanks (23% of farms) followed by lagoons (14%). Slurry in a tank is far more likely to have a cover than any other type of store (Table 6.2).

In 2016, 11% of livestock farmers planned to make changes to their manure or slurry storage facilities. Of these, 23% planned to make the changes within the next year and a further 48% in the next 1 to 3 years (Table 6.3).

Figure 6.2: Proportion of holdings with storage facilities for slurry by number of months of storage capacity: 2012 - 2016



The proportion of holdings that have 6 months storage capacity or less for slurry remains almost unchanged at 78%. Almost all of the remaining holdings had between 7 and 12 months capacity with only very few people having more than 12 months storage (Figure 6.2 and Table 6.4).

Table 6.1: Proportion of holdings with storage facilities for manure and/or slurry: 2013 – 2016 storage

Storage facility	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Solid manure stored in heaps on a solid base	48	*±3*	55	*±3*	58	*±3*	52	*±3*
Solid manure stored in temporary heaps in fields	63	*±3*	67	*±3*	68	*±2*	67	*±3*
Slurry in a tank	16	*±2*	20	*±2*	24	*±2*	23	*±3*
Slurry in a lagoon without strainer	15	*±2*	18	*±2*	15	*±2*	14	*±2*
Storage with strainer facility [(a)]	:	*:*	:	*:*	7	*±1*	6	*±1*
Slurry in another type of store	3	*±1*	9	*±2*	2	*±1*	2	*±1*

Based on no fewer than 1 546 responses in 2013, 1 533 in 2014, 1 679 in 2015 and 1 450 in 2016 from livestock holdings.
[(a)]This was a new option added to the survey in 2015 so some other categories may not be directly comparable with previous years.
: data not collected.

Table 6.2: Proportion of holdings having storage facilities for manure and/or slurry where the store is covered: 2013 - 2016

Storage facility	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Solid manure stored in heaps on a solid base	7	*±2*	13	*±3*	15	*±3*	17	*±3*
Solid manure stored in temporary heaps in fields	0	*±0*	1	*±1*	1	*±1*	1	*±1*
Slurry in a tank	14	*±4*	26	*±5*	28	*±5*	27	*±6*
Slurry in a lagoon without strainer	1	*±1*	3	*±2*	2	*±2*	3	*±2*
Storage with strainer facility [(a)]	:	*:*	:	*:*	3	*±3*	8	*±6*
Slurry in another type of store	9	*±6*	5	*±10*	1	*±1*	4	*±4*

Based on no fewer than 54 responses in 2013, 165 in 2014, 116 in 2015 and 82 in 2016 from livestock holdings that have the storage facilities in question.
(a) This was a new option added to the survey in 2015 so other categories may not be directly comparable with previous years.
: data not collected.

Table 6.3: Proportion of holdings planning to enlarge, upgrade or reconstruct their manure and slurry storage facilities: 2013 - 2016

	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Holdings planning to make changes to their current facilities [(a)]	14	*±2*	17	*±2*	13	*±2*	11	*±2*
Of those planning to make changes, the changes will be made: [(b)]								
In 0 to 6 months	16	*±5*	11	*±4*	13	*±5*	10	*±5*
In 7 to 11 months	19	*±7*	17	*±5*	14	*±5*	13	*±5*
In 1 to less than 3 years	44	*±7*	46	*±6*	49	*±7*	48	*±8*
In 3 to less than 5 years	10	*±4*	17	*±5*	14	*±5*	16	*±6*
In 5 years or more	11	*±4*	9	*±4*	10	*±4*	12	*±5*

(a) Based on 1 424 responses in 2013, 1 518 in 2014, 1 678 in 2015 and 1 446 in 2016 from livestock holdings that have manure or slurry storage facilities.
(b) Based on 219 responses in 2013, 284 in 2014, 233 in 2015 and 168 in 2016 from livestock holdings that are planning to make changes.

Table 6.4: Proportion of holdings with slurry stores by storage capacity: 2013 - 2016

Storage capacity	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
1 to 3 months	20	*±4*	22	*±4*	18	*±3*	21	*±4*
4 to 6 months	59	*±5*	57	*±4*	61	*±4*	58	*±4*
7 to 12 months	20	*±4*	19	*±3*	18	*±3*	20	*±4*
Over 12 months	1	*±1*	2	*±2*	3	*±1*	1	*±1*

Based on 518 responses in 2013, 592 in 2014, 673 in 2015 and 523 in 2016 from livestock holdings that have slurry storage facilities.

Table 6.5: Proportion of holdings that have a slurry separator: 2013 - 2016

	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Holdings who have a slurry separator	3	*±1*	4	*±1*	8	*±2*	8	*±2*

Based on 1 219 responses in 2013, 701 in 2014, 685 in 2015 and 552 in 2016 from livestock holdings.

Section 7. Farm health planning and biosecurity

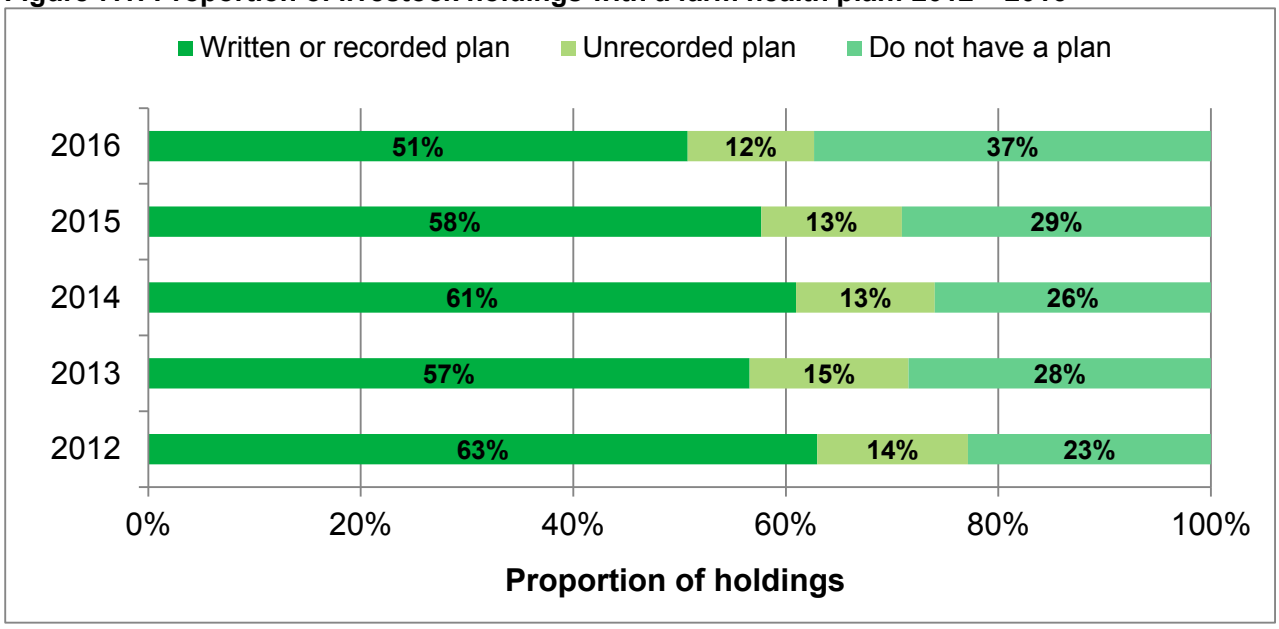
Farm health planning is a Defra initiative which benefits farmers by helping to prevent disease and improve the performance of their livestock. This can help to reduce GHG emissions over the course of an animal's lifetime by, for example, reaching finishing weights earlier and achieving higher feed conversion rates. Farm health planning is about farmers working closely with their vets or other advisers to set targets for their animals' health and welfare and take steps to measure, manage and monitor productivity.

Key findings

- Approximately 63% of farmers had a Farm Health Plan in 2016, down from 71% in 2015
- In 2016, just under half (49%) of farmers with a FHP used it on a routine basis to inform disease management decisions. This is a slight decrease from 51% in 2015.
- The number of FHPs completed with the help of a vet or adviser has continued to increase from 60% in 2009 to 74% in 2016.

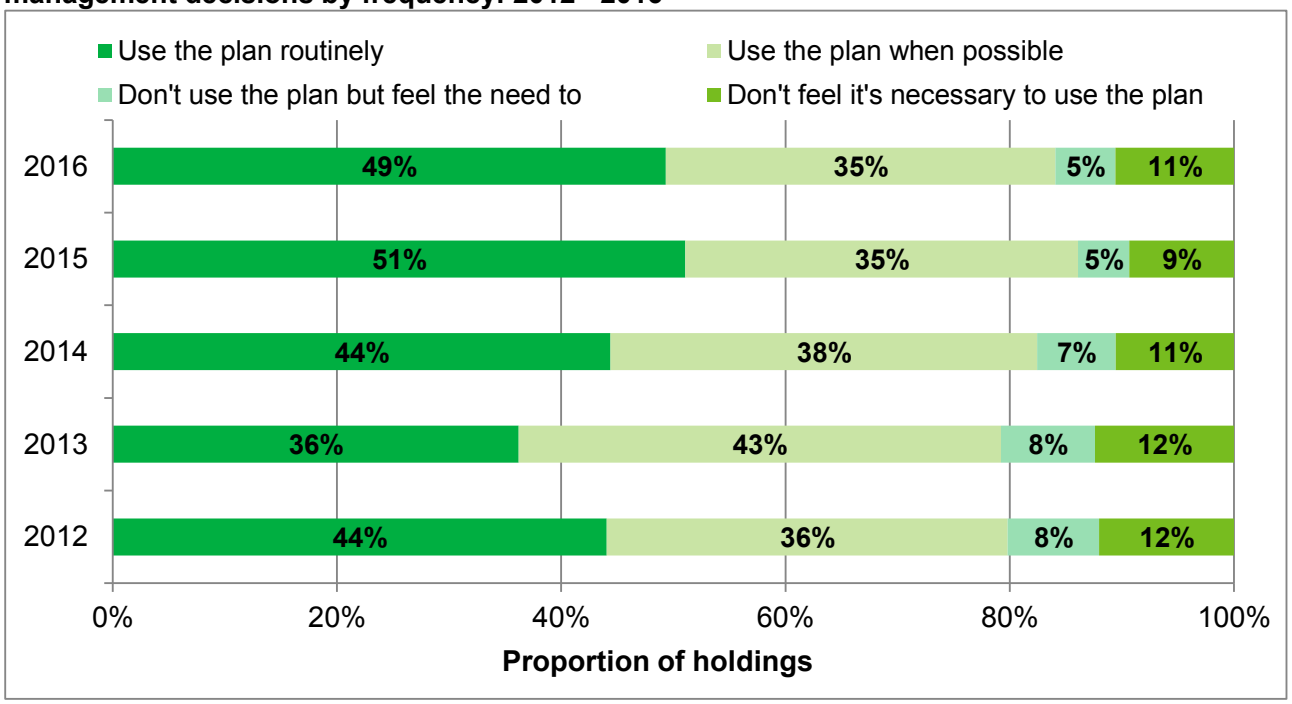
In 2016, 63% of livestock farms had a Farm Health Plan. The majority of livestock farmers have a written or recorded plan (51%) and 12% had a plan that was not recorded (Figure 7.1). Of those holdings with a FHP in 2016, 74% had created the plan with assistance from a vet or advisor (Table 7.2).

Figure 7.1: Proportion of livestock holdings with a farm health plan: 2012 – 2016



Of those with a Farm Health Plan in 2016, 84% were using it either routinely or when they could to inform disease management decisions and a further 5% felt that they should be doing so. The remaining 11% did not feel it was necessary to use the plan (Figure 7.2).

Figure 7.2: Proportion of livestock holdings using their farm health plan to inform disease management decisions by frequency: 2012 - 2016



Under half (46%) of livestock farmers undertake training for animal health and welfare and disease management either routinely or when they can. A further 12% said that although they did not undertake training they felt that they should and the remaining 41% did not feel training was necessary (Table 7.4).

Table 7.1: Proportion of livestock holdings with a farm health plan: 2012 - 2016

	% of holdings					95% CI
	2012	2013	2014	2015	2016	2016
Written or recorded plan	63	57	61	58	51	±2
Unrecorded plan	14	15	13	13	12	±2
No plan	23	28	26	29	37	±2

Based on 812 responses in 2012, 1 588 in 2013, 1 942 in 2014, 2 152 in 2015 and 1 905 in 2016 from livestock holdings.

Table 7.2: Proportion of holdings who completed their farm health plan with the assistance of a vet or adviser: 2012 - 2016

	% of holdings					95% CI
	2012	2013	2014	2015	2016	2016
Assistance from vet / adviser	65	63	70	72	74	±3

Based on 634 responses in 2012, 1 230 in 2013, 1 548 in 2014, 1 631 in 2015 and 1 295 in 2016 from holdings with livestock.

Table 7.3: Proportion of holdings using their farm health plan to inform disease management decisions by frequency of use: 2013 - 2016

Frequency of use	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Use plan routinely	36	*±3*	44	*±3*	51	*±3*	49	*±3*
Use plan when possible	43	*±3*	38	*±3*	35	*±3*	35	*±3*
Don't use plan but feel the need to	8	*±2*	7	*±1*	5	*±1*	5	*±1*
Don't feel it's necessary to use plan	12	*±2*	11	*±2*	9	*±2*	11	*±2*

Based on 1 228 responses in 2013, 1 553 in 2014, 1 632 in 2015 and 1 305 in 2016 from livestock holdings with a farm health plan.

Table 7.4: Proportion of holdings undertaking animal health and welfare and disease management training by frequency of training: 2013 - 2016

Frequency of training	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Undertake training routinely	14	*±2*	14	*±2*	18	*±2*	13	*±2*
Undertake training when possible	36	*±3*	37	*±2*	37	*±2*	33	*±2*
Don't undertake training but feel the need to	15	*±2*	14	*±2*	10	*±1*	12	*±2*
Don't feel training is necessary	35	*±3*	35	*±2*	35	*±2*	41	*±2*

Based on 1 585 responses in 2013, 1 934 in 2014, 2 142 in 2015 and 1 867 in 2016 from livestock holdings.

Section 8. Grassland and grazing

In some situations sowing temporary grassland with a clover mix or high sugar grasses can be a cost effective method of increasing production and improving environmental protection. For example, clover's nitrogen fixing properties (although not suitable for all soil types) can reduce the amount of nitrogen applied and improve grassland yields. High sugar grasses can help to improve the efficiency of animal production (for example, improved milk yields and faster live weight gain) which can in turn reduce GHG emissions.

Land and soil management mitigation methods can help to preserve good soil structure preventing erosion and compaction, both of which can lead to GHG emissions. Mitigation methods relating to this include keeping livestock away from water courses and reducing stocking rates when conditions are excessively wet.

Key findings

- In 2016, 74% of livestock holdings indicated that a proportion of their temporary grassland had been sown with a clover mix: 29% had sown all of their temporary grassland with a clover mix. This is unchanged since 2015.
- High sugar grasses were sown on 57% of livestock holdings with temporary grassland.
- The most common frequency for reseeding clover or high sugar grass swards in 2016 was 3 to 5 years.
- Almost three quarters (72%) of livestock farmers always take action to reduce stocking rates when fields are excessively wet.
- 61% of livestock farmers routinely try to keep livestock out of water courses.

Table 8.1: Proportion of livestock holdings that have sown their temporary grassland with a clover mix by proportion of grassland: 2013 - 2016

Proportion of temporary grassland (%)	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
100	32	±4	35	±3	29	±3	29	±3
81-99	7	±2	7	±2	5	±1	4	±2
61-80	7	±2	7	±2	7	±2	7	±2
41-60	11	±2	10	±2	8	±2	8	±2
21-40	10	±3	8	±2	8	±2	8	±2
1-20	12	±3	12	±2	16	±2	18	±3
0	21	±3	22	±3	26	±3	26	±3

Based on 775 responses in 2013, 967 in 2014, 1 106 in 2015 and 813 in 2016 from livestock holdings with temporary grass.

Table 8.2: Proportion of livestock holdings that have sown their temporary grassland with high sugar grasses by proportion of grassland: 2013 - 2016

Proportion of temporary grassland (%)	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
100	17	±3	20	±3	20	±3	17	±3
81-99	6	±2	6	±1	5	±1	4	±1
61-80	11	±2	9	±2	8	±2	7	±2
41-60	9	±2	9	±2	9	±2	8	±2
21-40	10	±2	6	±2	9	±2	9	±2
1-20	10	±3	8	±2	11	±2	11	±2
0	37	±4	42	±3	38	±3	43	±4

Based on 775 responses in 2013, 967 in 2014, 1 106 in 2015 and 810 in 2016 from livestock holdings with temporary grass.

Table 8.3: Proportion of holdings by the frequency with which holders reseed their clover sward: 2013 – 2016 [(a)]

Frequency of reseeding	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
1 to 12 months	1	±1	2	±2	1	±1	2	±1
1 to 2 years	5	±2	6	±2	4	±1	4	±2
2 to 3 years	10	±3	12	±2	8	±2	6	±2
3 to 5 years	50	±5	42	±4	32	±4	31	±4
5 to 10 years	32	±4	32	±4	24	±3	20	±4
10 years and over	1	±1	3	±2	1	±1	2	±1
Never/Do not reseed	1	±1	2	±2	29	±3	35	±4

Based on 586 responses in 2013, 733 in 2014, 801 in 2015 and 560 in 2016 from livestock holdings with temporary grass.
(a) Results for 2015 onwards are not directly comparable with previous years as the question was amended to include the option “do not reseed”. Those who did not reseed may have previously left the question blank.

Table 8.4: Proportion of holdings by the frequency with which holders reseed their high sugar grass sward: 2013 – 2016 [(a)]

Frequency of reseeding	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
1 to 12 months	1	±1	2	±1	1	±1	2	±1
1 to 2 years	7	±2	8	±3	5	±2	5	±2
2 to 3 years	15	±3	18	±3	9	±2	13	±3
3 to 5 years	43	±5	41	±4	34	±4	36	±5
5 to 10 years	32	±4	26	±4	23	±3	24	±4
10 years and over	1	±1	3	±2	2	±1	2	±2
Never/ Do not reseed	1	±1	2	±1	26	±4	17	±4

Based on 504 responses in 2013, 575 in 2014, 694 in 2015 and 428 in 2016 from livestock holdings with temporary grass.
(a) Results for 2015 onwards are not directly comparable with previous years as the question was amended to include the option “do not reseed”. Those who did not reseed may have previously left the question blank.

Table 8.5: Frequency with which livestock holdings take action to reduce stocking rates when fields are excessively wet: 2015 - 2016

Frequency	2015		2016	
	% of holdings	95% CI	% of holdings	95% CI
Always	75	±*2*	72	±*3*
Some of the time	24	±*2*	26	±*2*
Never	1	±*1*	2	±*1*

Based on 1 939 responses in 2015 and 1 603 in 2016 from holdings with livestock.

Table 8.6: Frequency with which livestock holdings take action to keep livestock out of water courses: 2015 - 2016

Frequency	2015		2016	
	% of holdings	95% CI	% of holdings	95% CI
Routinely	65	±*2*	61	±*3*
Some of the time	26	±*2*	28	±*3*
Never	9	±*2*	11	±*2*

Based on 1 780 responses in 2015 and 1 454 in 2016 from holdings with livestock.

Section 9. Livestock feeding regimes and breeding practices

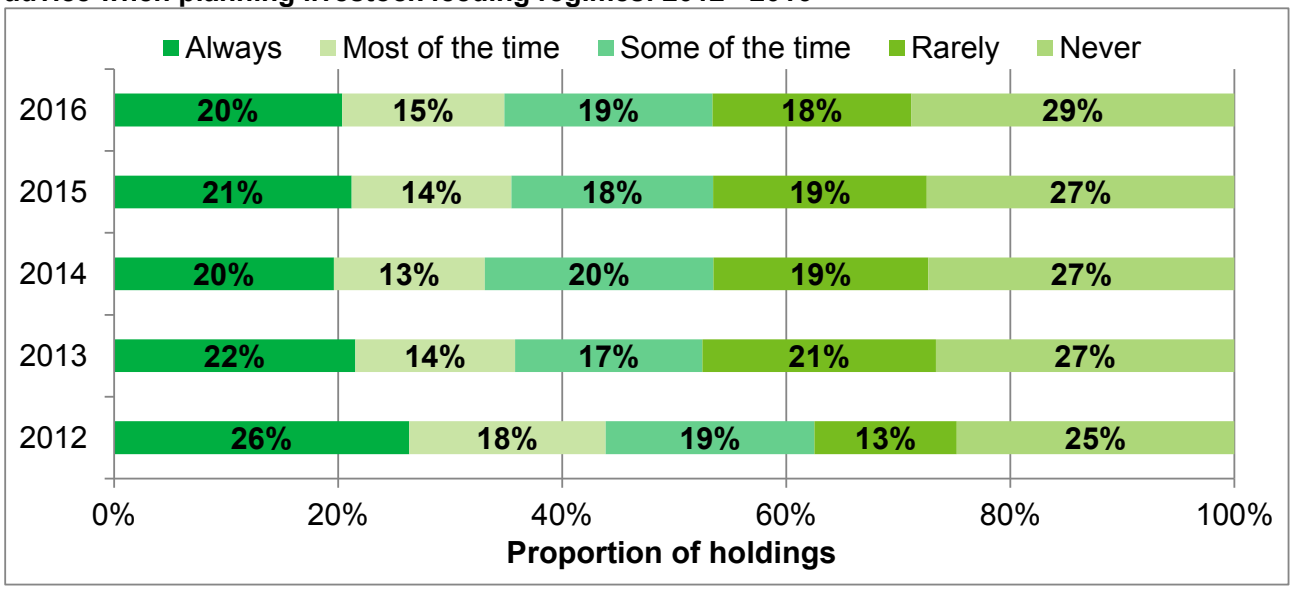
Cattle and sheep breeding practices are another area which can contribute to herd and flock productivity and efficiency which in turn can reduce GHG emissions. A Profitable Lifetime Index (PLI) is a scoring system to identify cattle with the best 'genetic merit' used when choosing bulls to breed with dairy cattle. The PLI uses a combination of attributes including life expectancy, health, fertility and milk production. Estimated Breeding Values (EBV) estimate the genetic worth of animals using desirable traits such as meat production. In addition to playing an important role in productivity and efficiency, livestock feeding practices such as intake and type of feed, can have an impact on GHG emissions.

Key findings

- In 2016, 71% of livestock holdings used a ration formulation programme or nutritional advice. This has remained almost unchanged since 2011.
- Whole-crop silage and maize were the most common alternative forages (other than grazed or conserved grass) offered to cattle and sheep by 13% and 10% of farmers respectively.
- In 2016, 22% of holdings breeding dairy cows always used bulls with a high Profitable Lifetime Index (PLI).
- Bulls and rams with high Estimated Breeding Values (EBV) were always used by 18% of holdings breeding beef cattle and 8% of those breeding lambs in 2016.

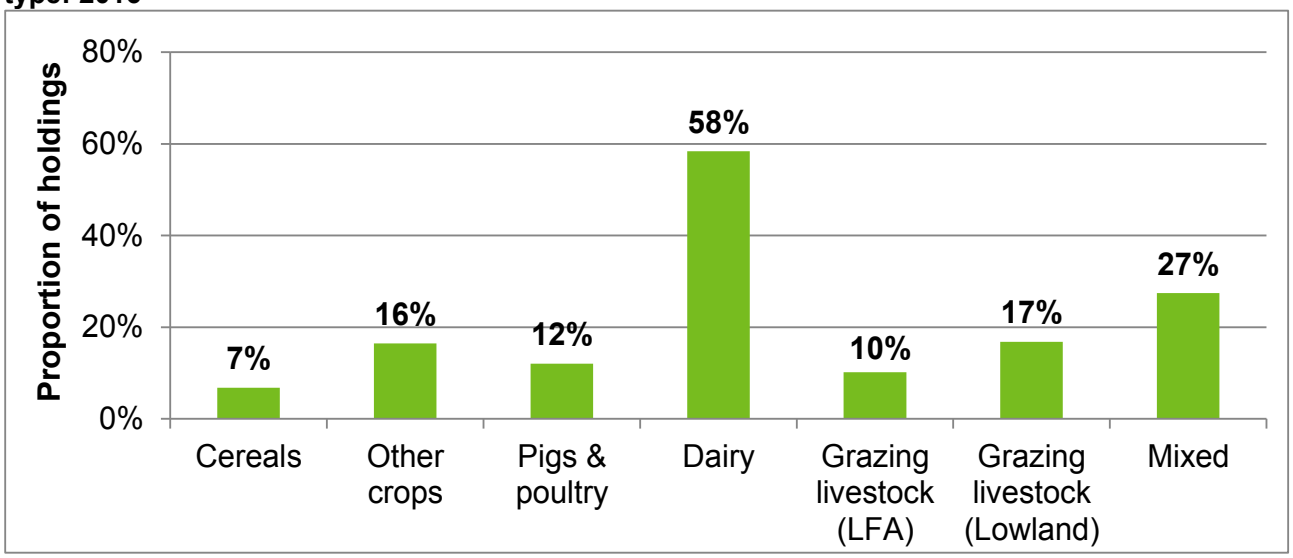
In 2016, just over half (53%) of livestock holdings used a ration formulation programme or expert nutritional advice when planning the feeding regime of their cattle and sheep at least some of the time (Figure 9.1).

Figure 9.1: Proportion of holdings using a ration formulation program or expert nutritional advice when planning livestock feeding regimes: 2012 - 2016



Under a quarter (23%) of farmers offered alternative forages (other than grazed or conserved grass) to their cattle and sheep in 2016. As might be expected this figure varies depending on farm type and dairy farmers are most likely to offer their livestock alternative forages (Figure 9.2).

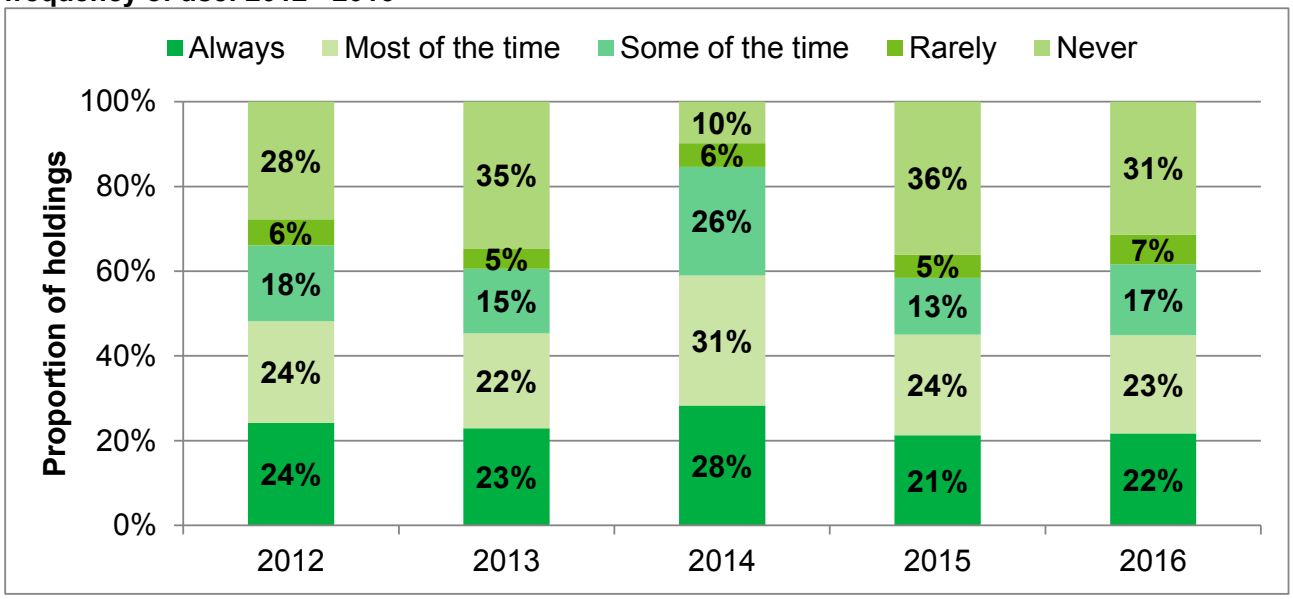
Figure 9.2: Proportion of holdings offering alternative forage crops to cattle and sheep by farm type: 2016[(a)]



(a) For holdings with cattle and/or sheep

The most common of these forage crops were whole-crop silage and maize which were offered by 13% and 10% of farmers respectively. Once again this varied by farm type with 39% of dairy farmers offering their livestock maize and 33% offering them whole-crop silage.

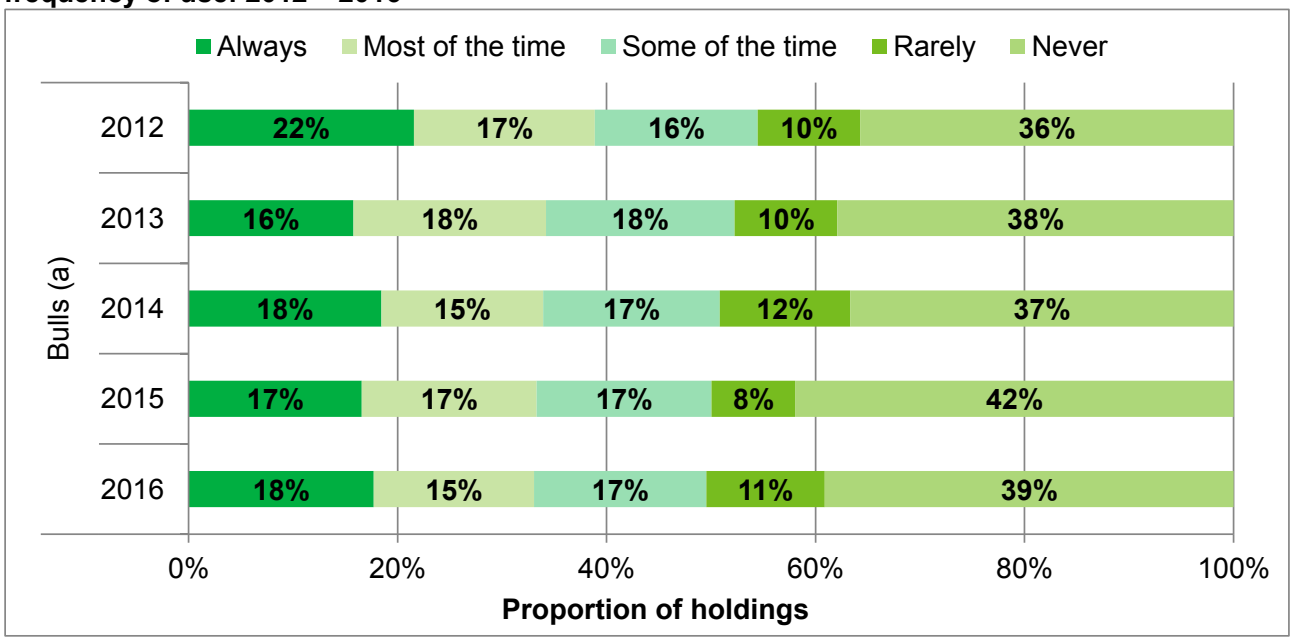
Figure 9.3: Proportion of holdings using bulls with a high PLI when breeding dairy cows by frequency of use: 2012 - 2016 [(a)]



(a) For holdings with dairy cattle

In 2016, 22% of livestock holdings always used bulls with a high Profitable Lifetime Index (PLI) when breeding dairy cows. This is similar to previous years and shows little change from 2015 (Table 9.4).

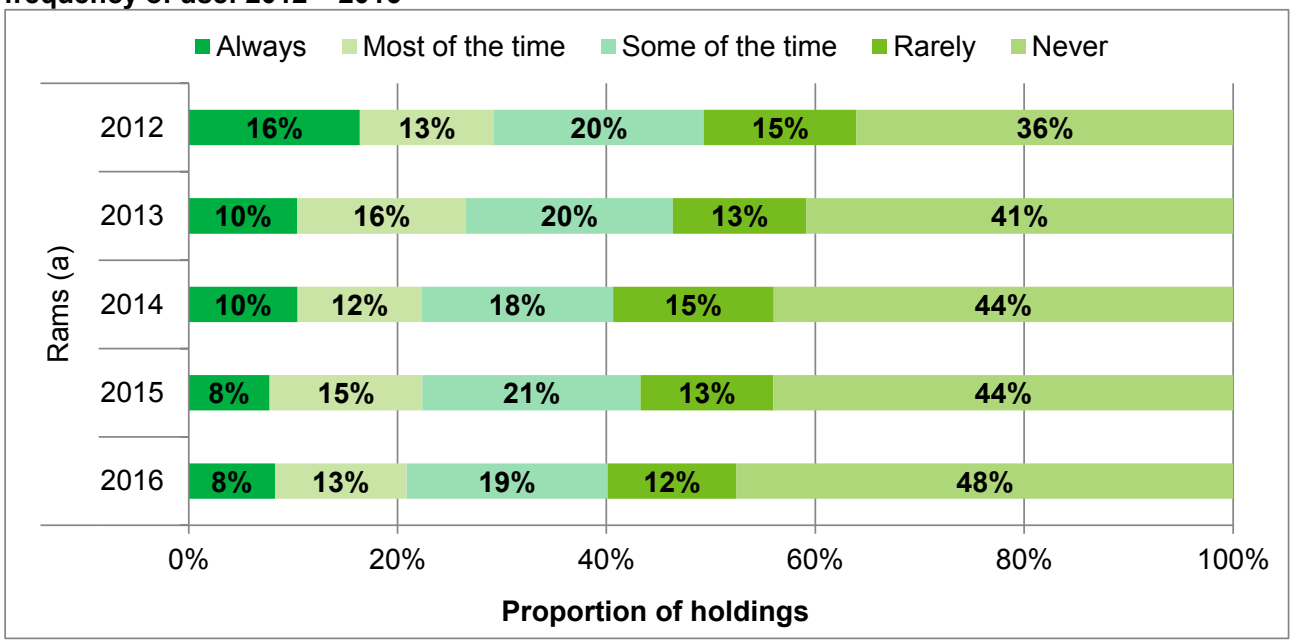
Figure 9.4: Proportion of holdings using bulls with high EBVs when breeding beef cattle by frequency of use: 2012 – 2016



(a) For holdings with beef cattle

Estimated Breeding Values (EBV) estimate the genetic worth of animals using desirable traits such as meat production. Half of holdings used bulls with a high EBV at least some of the time when breeding beef cattle in 2016 (Figure 9.4). This is little changed from 2015. The equivalent proportion of holdings using rams with a high EBV at least some of the time when breeding lambs was 40% (Figure 9.5).

Figure 9.5: Proportion of holdings using rams with high EBVs when breeding lambs by frequency of use: 2012 – 2016



(a) For holdings with lambs

In addition to the proportion of holdings using bulls and rams with high EBVs (Table 9.5 and 9.6) the proportion of beef cattle and lambs that this figure relates to has also been calculated (Tables 9.7 and 9.8). By using responses from the 2015 June survey we are able to give an indication of the proportion of animals that are covered by this practice. In 2016, the holdings using bulls and rams with high EBVs at least some of the time accounted for 61% of beef cattle and 50% of lambs at June 2015.

Table 9.1: Proportion of holdings using a ration formulation programme when planning cattle and sheep feeding regimes by frequency of use: 2013 - 2016

Frequency of use	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Always	22	±2	20	±2	21	±2	20	±2
Most of the time	14	±2	13	±2	14	±2	15	±2
Some of the time	17	±2	20	±2	18	±2	19	±2
Rarely	21	±3	19	±2	19	±2	18	±2
Never	27	±3	27	±2	27	±2	29	±3

Based on 1 333 responses in 2013, 1 679 in 2014, 1 748 in 2015 and 1,470 in 2016 from holdings with cattle or sheep.

Table 9.2: Proportion of holdings offering alternative forages to cattle and sheep: 2015 - 2016

Alternative forage crop	2015		2016	
	% of holdings	95% CI	% of holdings	95% CI
Whole-crop silage	15	±2	13	± 2
Maize	13	±1	10	±1
Red clover	6	±1	6	±1
Lucerne	2	±1	1	±1
Triticale	1	±0	1	±0
Any of the above	26	±2	23	±2
None of these	74	±2	78	±2

Based on 1 678 responses in 2015 and 1,409 in 2016 from holdings with cattle and sheep.

Table 9.3: Proportion of annual diet that alternative forage crops account for: 2016

Alternative forage crop	% of annual diet	95% CI
Whole-crop silage	26	±4
Maize	31	±2
Red clover	20	±4
Lucerne	11	±4
Triticale	12	±4

Based on 234 (whole-crop silage), 231 (maize), 105 (red clover), 28 (lucerne) and 10 (triticale) responses in 2016 from holdings with cattle and sheep.

Table 9.4: Proportion of holdings using bulls with a high Profitable Lifetime Index (PLI) when breeding dairy cows by frequency of use: 2013 - 2016

Frequency of use	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Always	23	±4	28	±4	21	±3	22	±4
Most of the time	22	±4	31	±4	24	±3	23	±4
Some of the time	15	±3	26	±4	13	±3	17	±3
Rarely	5	±2	6	±2	5	±2	7	±2
Never	35	±5	10	±3	36	±4	31	±5

Based on 505 in 2013, 445 in 2014, 614 in 2015 and 458 in 2016 from holdings with cattle or sheep.

Table 9.5: Proportion of holdings using bulls with a high Estimated Breeding Value (EBV) when breeding beef cattle by frequency of use: 2013 - 2016

Frequency of use	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Always	16	±3	18	±3	17	±2	18	±3
Most of the time	18	±3	15	±2	17	±2	15	±3
Some of the time	18	±3	17	±2	17	±2	17	±3
Rarely	10	±2	12	±2	8	±2	11	±2
Never	38	±4	37	±3	42	±3	39	±4

Based on 822 in 2013, 1 063 in 2014, 1 123 in 2015 and 707 in 2016 from holdings with beef cattle.

Table 9.6: Proportion of holdings using rams with a high Estimated Breeding Value (EBV) when breeding lambs by frequency of use: 2013 - 2016

Frequency of use	2013		2014		2015		2016	
	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI	% of holdings	95% CI
Always	10	±3	10	±2	8	±2	8	±2
Most of the time	16	±3	12	±2	15	±3	13	±3
Some of the time	20	±4	18	±3	21	±3	19	±3
Rarely	13	±3	15	±3	13	±2	12	±3
Never	41	±5	44	±4	44	±4	48	±4

Based on 612 in 2013, 811 in 2014, 842 in 2015 and 700 in 2016 from holdings with lambs.

Table 9.7: Proportion of beef cattle on holdings using bulls with a high Estimated Breeding Value (EBV) by frequency of use: 2014 - 2016

Frequency of use	2014		2015		2016	
	% of beef cattle	95% CI	% of beef cattle	95% CI	% of beef cattle	95% CI
Always	23	±4	19	±3	25	±6
Most of the time	18	±3	18	±3	19	±4
Some of the time	17	±3	19	±3	18	±4
Rarely	11	±2	9	±2	10	±3
Never	31	±4	34	±4	29	±4

Based on 1 063 in 2014, 1 123 in 2015 and 707 in 2016 from holdings with beef cattle.

Table 9.8: Proportion of lambs on holdings using rams with a high Estimated Breeding Value (EBV) by frequency of use: 2014 - 2016

Frequency of use	2014		2015		2016	
	% of lambs	95% CI	% of lambs	95% CI	% of lambs	95% CI
Always	12	±3	10	±3	11	±4
Most of the time	12	±3	15	±3	17	±4
Some of the time	22	±4	24	±4	22	±4
Rarely	18	±3	14	±3	14	±4
Never	36	±4	36	±4	36	±5

Based on, 811 in 2014, 842 in 2015 and 700 in 2016 from holdings with lambs.

Survey methodology

Survey content
The Farm Practices Survey (FPS) – Greenhouse Gas Mitigation edition is usually run annually and collects information on a diverse range of topics usually related to the impact of farming practices on the environment. Each year, stakeholders are invited to request new questions to help inform policy decisions and provide evidence on progress towards agricultural and environmental sustainability.

This release includes the results from the FPS run in February 2016. The survey largely focused on practices relating to greenhouse gas mitigation, similar in content to FPS surveys run in February over the previous five years. Topics covered include nutrient and manure management, anaerobic digestion, emissions, fertiliser, manure & slurry spreaders and storage, farm collaboration, farm health planning, grassland & grazing and livestock breeding & feeding practices. Where comparisons with earlier years are possible, the results are displayed alongside those from previous years.

The results provided in this release are based on questions sent to approximately 6,000 holdings in England. These holdings were targeted by farm type and size to ensure a representative sample. The survey was voluntary and the response rate was 38%. Thank you to all of the farmers who completed a survey form.

Thresholds were applied to ensure that very small holdings with little agricultural activity were not included in the survey. To be included in the main sample, holdings had to have at least 50 cattle, 100 sheep, 100 pigs, 1,000 poultry or 20 hectares of arable crops or orchards. Therefore, all results given in this statistical release reflect only the 61 thousand holdings that exceed these thresholds out of the total English population of 104 thousand commercial holdings.

A breakdown of the number of holdings within the population and the sample are shown below.

Farm type	Number of eligible holdings in England	Number of holdings sampled	Response rate %
Cereals	15 205	1 237	43
Other crops	5 735	819	43
Pigs & poultry	3 412	484	29
Dairy	6 482	979	38
Grazing livestock (less favoured areas)	8 460	686	37
Grazing livestock (lowland)	15 759	1 204	34
Mixed	5 816	603	42
All farms	**60 869**	**6 012**	**38**

Data analysis
Results have been analysed using a standard methodology for stratified random surveys to produce national estimates. With this method, all of the data are weighted according to the inverse sampling fraction.

Accuracy and reliability of the results
We show 95% confidence intervals against the results. These show the range of values that may apply to the figures. They mean that we are 95% confident that this range contains the true value. They are calculated as the standard errors (se) multiplied by 1.96 to give the 95% confidence interval (95% CI). The standard errors only give an indication of the sampling error. They do not reflect any other sources of survey errors, such as non-response bias.

Definitions
Where reference is made to the *type of farm* in this document, this refers to the 'robust type', which is a standardised farm classification system. *Farm sizes* are based on the estimated labour requirements for the holding, rather than its land area. The farm size bands used within the detailed results tables which accompany this publication are shown in the table below. Standard Labour Requirement (SLR) is defined as the theoretical number of workers required each year to run a holding, based on its cropping and livestock activities.

Farm size	Definition
Small	Less than 2 SLR
Medium	2 to less than 3 SLR
Large	3 or more SLR

Availability of results
This release contains headline results for each section. The full breakdown of results, by region, farm type and farm size, will be available on 30 June 2016 at:
https://www.gov.uk/government/collections/farm-practices-survey.

Other Defra statistical notices can be viewed on the Defra website at:
https://www.gov.uk/government/organisations/department-for-environment-food-rural-affairs/about/statistics.

Data uses
The Farm Practices survey is used to investigate the impact of farming on the environment and to provide up-to-date agri-environment information on current issues to help inform policy decisions. The survey has a wide customer base both internal and external to Defra including Natural England, English Heritage, ADAS, the Environment Agency and the NFU.

Data from the Farm Practices Survey are used in Defra's greenhouse gas (GHG) indicator framework. The framework, initially developed as part of the 2012 review of progress in reducing GHG emissions from English agriculture[1], consists of ten key indicators covering farmer attitudes and knowledge, the uptake of mitigation methods and the GHG emission intensity of production[2] in key agricultural sectors. Information from the survey also feeds into the Defra publication, Agricultural Statistics and Climate Change which provides background context to the current understanding of agriculture and GHG emissions.

In partnership with the Devolved Administrations, the Government has invested over £12 million, over a four and half year period, on the development of an improved GHG inventory to strengthen our understanding of on farm emissions. Information from the Farm Practices Survey has fed into this project which should enable greater precision in reporting GHG emissions from the sector, so that changes made to farming practices to reduce GHG emissions will be properly recognised in the inventory. Improved emissions factors have been incorporated into the 2016 UK agricultural GHG inventory and it is planned to use the fully revised smart inventory model in the 2017 inventory.

Additional information
For more information on how the data was collected you can view the questions asked on our survey form in Annex I over the page.

Finally we are keen to hear your thoughts on this statistical release. If you found the data useful or if you have any other comments please let us know. You can contact us via the phone number on the front page or alternatively email us at farming-statistics@defra.gsi.gov.uk.

[1] https://www.gov.uk/government/publications/2012-review-of-progress-in-reducing-greenhouse-gas-emissions-from-english-agriculture
[2] GHG produced per tonne of crop or litre of milk or kilogramme of meat produced.

Annex I

Department for Environment Food & Rural Affairs

If there are any amendments to the contact details, please notify the Rural Payments Agency by telephone 03000 200 301 or email ruralpayments@defra.gsi.gov.uk.

Please **also** show the changes in the box below for update of your survey details, **otherwise leave blank**.

Name:

Address:

Postcode:

Amendments Only

Farm Practices Survey - February 2016

Dear Sir/Madam

You are invited to participate in the February 2016 Farm Practices Survey. This survey aims to assess how farming practices are affected by current agricultural and environmental issues. We have tried to make the form as straightforward as possible and most of the questions can be answered using tick boxes.

Please note that this is a voluntary survey. Any information you supply on this form will not be used to assess cross-compliance on your holding and will not affect your Basic Payment Scheme payment. The aim of these questions is to ensure that those making decisions affecting farmers know what really happens on farms.

The results from the survey are important and will be used widely within Defra, its agencies and other external bodies. We can use some information from the June Survey of Agriculture and Horticulture or from other national surveys, but there are important gaps which this survey will help to fill. Results from this survey will be available from the end of Spring 2016 on the following website: **https://www.gov.uk/government/collections/farm-practices-survey**.

I would be very grateful if you would take the time to complete this form and return it in the enclosed pre-paid envelope. If you could complete and return it within 2 weeks of receipt, this will avoid the need for reminder letters. This survey form has been sent to a randomly selected sample of 6,000 holdings and a good response will improve the reliability of the results. For guidance on completing the form, please telephone or email using the details below.

Data Protection
Any information you provide to us is treated in confidence. Defra is the Data Controller in respect of the Data Protection Act 1998. The purposes for which it is used are set out in full in a data protection statement which can be found at **http://bit.ly/Data_Protection_Statement**. Alternatively we can send you a copy if you call 01904 455284 or email surveys@defra.gsi.gov.uk.

We greatly appreciate the time and effort you spend completing our survey forms. Thank you for your assistance.

Jennie Blackburn
Farming Statistics Team

Official Use Only

Name/Address	
Comments in box	
Comments elsewhere	

If you require a large print form please contact us on 01904 455284

For help with completion of the form contact us at:

Helpline: 01904 455284 Mon-Fri 9.00am to 4.30pm

Email: surveys@defra.gsi.gov.uk

Section 1. Soil Nutrient Management

(i) Nutrient management plans

1. Have you completed a nutrient management plan for your farm?

Yes ☐ 1 | No ☐ 2 | Not applicable ☐ 3 C68 → **If No or Not applicable, please go to question 7**

2. If yes, did you create the plan yourself or was it created by an adviser or contractor?

I created the plan myself without professional advice ☐ C4 → **If ticked, please go to question 3**

OR

	Fertiliser adviser or agronomist	Animal nutritionist	FWAG	Other	
I created the plan myself with professional advice from:	☐ 1	☐ 2	☐ 3	☐ 4	C125
OR					
The plan was created by the above type of adviser or contractor:	☐ 1	☐ 2	☐ 3	☐ 4	C6

3. How often do you update your nutrient management plan? Please tick **one** box

Every year ☐ 1 | Every 2 years ☐ 2 | Every 3 years or more ☐ 3 C82

4. How often do you refer to your nutrient management plan in a year? Please tick **one** box

More than 10 times ☐ 1 | 6 to 10 times ☐ 2 | 1 to 5 times ☐ 3 | Never ☐ 4 C7

5. How did you or your adviser/contractor create the nutrient management plan? Tick **all** that apply

PLANET	Muddy Boots	Farmade / Multicrop	Industry plan - Tried and Tested	Other	I don't know
☐ C69	☐ C70	☐ C71	☐ C72	☐ C74	☐ C8

6. What are the nutrient recommendations for your nutrient management plan based on? Tick **all** that apply

Defra Recommendations / Manual (RB209)	An adviser's or industry note	Personal experience	Other	I don't know
☐ C75	☐ C9	☐ C10	☐ C76	☐ C86

(ii) Nutrient testing

Tick **one** box in each row

7. Do you have a programme of soil testing for nutrient indices?

Yes ☐ 1 | No ☐ 2 | Not applicable ☐ 3 C63 → **If No or Not applicable, please go to question 9**

8. If yes, do you test each field at least every 5 years?

All of them ☐ 1 | Some of them ☐ 2 | None of them ☐ 3 C140

9. Do you have a programme of soil testing for pH?

Yes ☐ 1 | No ☐ 2 | Not applicable ☐ 3 C92 → **If No or Not applicable, please go to question 11**

10. If yes, do you test each field at least every 5 years?

All of them ☐ 1 | Some of them ☐ 2 | None of them ☐ 3 C141

Soil Nutrient Management (continued)

11. Do you test/assess/calculate the nutrient content of manure?

Yes, by sampling and lab analysis	Yes, by sampling and on-farm testing	Yes, based on published tables	No	Not applicable	
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	C142

(iii) Manure management plans

12. Have you completed a manure management plan for your farm?

Yes	No	Not applicable	
☐ 1	☐ 2	☐ 3	C65

If No or not applicable, please go to Section 2

13. If yes, are the nutrient recommendations for this plan based on:

Defra Recommendations/Manual (RB209), CoGAP ☐ C66

Other (please specify) ☐ C67

(iv) Soil Monitoring

14. Do you keep track of soil organic matter on your farm?

Yes	No	
☐ 1	☐ 2	C206

If Yes, please go to question 16

15. What are the reasons stopping you from keeping track of soil organic matter on your farm?
Tick **all** that apply

Too expensive ☐ C207

Not important enough to test for ☐ C208

Difficult to interpret results ☐ C209

Other (please specify) ☐ C210

16. Do you know the soil types as described in Appendix 1 of Defra Recommendations/Manual (RB209) for each field on your farm?

Yes	No	
☐ 1	☐ 2	C211

Section 2. Anaerobic Digestion

17. Do you already process any of the following by anaerobic digestion either on your farm or elsewhere?
Tick one box in **every** row

	Yes	No	
Slurries / manures	☐ 1	☐ 2	A19
Crops (including silage)	☐ 1	☐ 2	A52
Other feedstocks from your farm	☐ 1	☐ 2	A20
Other feedstocks from outside your farm	☐ 1	☐ 2	A21

Section 3. Emissions

18. How important do you feel it is to consider greenhouse gases (GHGs) when taking decisions about your land, crops and livestock? Please tick **one** box only

Very important	Fairly important	Not very important	Not at all important	My farm does not produce GHGs	
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	D51

19. To what extent do you agree that reducing your farm's greenhouse gas emissions will contribute to improving your overall profitability? Please tick **one** box only

Strongly agree	Agree	Disagree	Strongly disagree	
☐ 1	☐ 2	☐ 3	☐ 4	D52

20. Are you currently taking any action to reduce greenhouse gas emissions from your farm? Yes ☐ 1 No ☐ 2 D64 → **If No, please go to question 23**

21. What actions are you taking to reduce greenhouse gas emissions from your farm? Tick **all** that apply

Improving energy efficiency (e.g. reducing electricity use, using reduced tillage)	☐ D65
Recycling of waste materials from the farm (e.g. tyres, plastics)	☐ D66
Improving nitrogen feed efficiency, livestock diets (e.g. using a ration formulation program)	☐ D67
Improving efficiency in manure and slurry management and application (e.g. controlled application rate, improved timing)	☐ D68
Improving nitrogen fertiliser application accuracy (e.g. using a fertiliser recommendation system, regularly checking and calibrating fertiliser spreaders)	☐ D69
Increasing use of legumes in arable rotation	☐ D70
Increasing use of clover in grassland	☐ D71
Other, please specify	D72

22. What are your main motivations for taking these actions? Tick **all** that apply

I consider it good business practice	☐ D73
Regulation	☐ D74
To improve profitability	☐ D75
Concern for the environment	☐ D76
To meet market demands	☐ D77
Other, please specify	D78

23. What are the reasons stopping you taking action to reduce greenhouse gas emissions from your farm?

Tick **all** that apply

Lack of information	☐ D79
Too expensive	☐ D80
Lack of incentive	☐ D81
I've already done all I can	☐ D82
I don't believe there is much farmers can do	☐ D83
It's not necessary as I don't think my farm produces many emissions	☐ D84
I'm unsure what to do as there are too many conflicting views on the issue	☐ D85
Other, please specify	D86

Section 4. Fertiliser, manure and slurry spreaders

24. Are any of the manure, slurry or fertiliser spreaders on your farm computer controlled with variable rate application? Please tick **all** that apply

Yes, fertiliser spreaders ☐ 1 | Yes, manure or slurry spreaders ☐ 2 | No, none of them ☐ 3 | I do not have any spreaders ☐ 4 C104 → **If no spreaders, please go to section 5**

25. Do you or contractors spread fertilisers, solid manure or slurry on your grass or arable land?

Tick **one** box in each column

	Fertiliser	Manure or slurry
Yes, I spread it myself	☐ C132	☐ C149
Yes, I spread some myself and also use a contractor	☐ C133	☐ C150
Yes, a contractor spreads it	☐ C134	☐ C151
No, not applied to grass or arable land	☐ C135	☐ C152

26. On average, which of the following options best describes how often your manure (solid manure or slurry) spreader is calibrated? Exclude fertiliser spreaders.

Tick **one** box only

I do not have a manure spreader	☐ C173
Never	☐ C136
Every year	☐ C160
Less often than every year	☐ C161
Whenever there is significant change in manure or slurry characteristics	☐ C137
Whenever manure or slurry is tested (e.g. sampled or analysed)	☐ C138
Other, please specify	C139

Section 5. Farm Collaboration

27. Are you involved, either formally or informally, in any of the following forms of co-operation or joint working with other farmers? Please tick **all** that apply

Membership of buying group(s)	☐ E92	Swapping manure and straw	☐ E100
Membership of discussion group(s)	☐ E93	Lending breeding sires	☐ E101
Membership of producer organisation/co-op(s)	☐ E94	Share farming	☐ E102
Membership of trade union(s) (e.g. NFU)	☐ E95	Sharing labour - informal arrangement	☐ E103
Commons agreement (any type, including AES)	☐ E96	Sharing labour - formal arrangement	☐ E104
Environmental management (e.g. joint agri-environment scheme agreement)	☐ E97	Sharing machinery - informal arrangement	☐ E105
Contract rearing of any livestock for or by other farmers	☐ E98	Sharing machinery - formal arrangement	☐ E106
Contract growing of any crop for or by other farmers	☐ E99	Short term keep of livestock for or by other farmers	☐ E107

Other, please specify E108

Note **28. The following sections relate to holdings with livestock (cattle, sheep, pigs, poultry or horses). If you do not have livestock, please tick this box and go to section 10 on page 8.** ☐ T94

Section 6. Manure and slurry storage

29. Do you have storage facilities for solid manure on your farm? Please tick **one** box only

Yes ☐ 1

No - I spread directly from shed (no further storage) ☐ 2

No - my farm does not produce manure ☐ 3 P207

If No, please go to question 31

30. Please indicate your manure storage facilities by type of store and type of cover. Tick **all** that apply.

	No cover	Plastic sheet cover	Solid store cover
Solid manure in heaps on a solid base	☐ P208	☐ P209	☐ P210
Solid manure in temporary heaps in fields	☐ P211	☐ P212	

31. Do you have storage facilities for slurry on your farm? Please tick **one** box only

Yes ☐ 1

No - I have little or no storage & spread directly ☐ 2

No - my farm does not produce slurry ☐ 3 P217

If no slurry produced, please go to question 35

32. How many months storage capacity do you have for slurry? ☐ months P69

33. Please indicate your slurry storage facilities by type of store and type of cover. Tick **all** that apply.

	No cover	Natural crust	Floating plastic cover	Floating straw /woodchip	Rigid/fixed cover
In-house storage in channel below slats	☐ P218				
Below ground tank	☐ P219	☐ P223	☐ P227	☐ P231	☐ P235
Above ground tank	☐ P220	☐ P224	☐ P228	☐ P232	☐ P236
Lagoon without strainer	☐ P221	☐ P225	☐ P229	☐ P233	☐ P237
Storage with strainer facility (e.g. lagoon with strainer wall or weeping wall compound)	☐ P247	☐ P248	☐ P249	☐ P250	☐ P251
Other type	☐ P222	☐ P226	☐ P230	☐ P234	☐ P238

34. Do you have a slurry separator? Yes ☐ 1 No ☐ 2 P70

35. Are you planning to enlarge, upgrade or reconstruct any of your manure or slurry storage facilities? Yes ☐ 1 No ☐ 2 P67

If No, please go to section 7

36. If yes, when are you planning to make the majority of these changes? Please tick **one** box

	In 0 to 6 months	In 7 to 11 months	In 1 to less than 3 years	In 3 to less than 5 years	In 5 to less than 10 years	In 10 years or more
Changes planned:	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6 P68

Section 7. Farm Health Planning and Biosecurity

37. Do you have a Farm Health Plan (FHP)? Please tick **one** box only

Yes, a written or recorded plan ☐ T92 | Yes, but not written or recorded ☐ T91 | No ☐ T90 → **If No, please go to question 40**

38. If yes, did you complete the FHP with the assistance of a vet or other adviser? Yes ☐ 1 No ☐ 2 T93

39. Do you review and use your FHP to inform disease management decisions? Please tick **one** box only

Yes, routinely ☐ 1 | Yes, when I can ☐ 2 | No, but I feel I should ☐ 3 | No, I don't feel the need ☐ 4 T130

40. Do you or your staff undertake training on animal health & welfare and disease management?
Please tick **one** box only

Yes, routinely ☐ 1 | Yes, when I / my staff can ☐ 2 | No, but I feel I should ☐ 3 | No, I don't feel the need ☐ 4 T135

Section 8. Grassland and grazing

(i) Temporary grassland

41. Questions 42, 43 and 44 relate to temporary grassland. If you do not have any temporary grassland, please tick this box and go to question 45. ☐ K95

42. What percentage of your temporary grassland has been sown with a clover mix or high sugar grasses?

	0%	1-20%	21-40%	41-60%	61-80%	81-99%	100%	
Clover	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	K96
High sugar grasses	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7	K97

43. Do you reseed your clover or high sugar grasses? Tick **all** that apply

Yes, reseed clover ☐ K88 | Yes, reseed high sugar grasses ☐ K89 | No, do not reseed ☐ K49 **If No, please go to question 45**

44. If yes, please state the frequency (in months) with which you reseed your sward.

Clover ☐☐ months K98 | High sugar grasses ☐☐ months K99

(ii) Grazing

45. Do you take action to reduce stocking rates when fields are excessively wet? Please tick **one** box only

Yes, Always ☐ 1 | Yes, some of the time ☐ 2 | No ☐ 3 | Not applicable ☐ 4 K47

46. Do you take action to keep livestock out of water courses? Please tick **one** box only

Yes, routinely ☐ 1 | Yes, some of the time ☐ 2 | No ☐ 3 | Not applicable ☐ 4 K48

Section 9. Ruminant livestock feeding regimes and breeding practices

47. How often do you or your adviser use a ration formulation program or nutritional advice from an expert when planning the feeding regime for your livestock? Please tick **one** box only

Always	Most of the time	Some of the time	Rarely	Never
☐ C105	☐ C106	☐ C107	☐ C108	☐ C109

48. Do you offer any alternative forages (other than grazed or conserved grass) to your livestock? Tick **all** that apply.

Maize	Lucerne	Triticale	Red clover	Whole-crop silage	None of these	
☐ C162	☐ C163	☐ C164	☐ C165	☐ C171	☐ C166	**If None, please go to question 50**

49. Please indicate the proportion of the annual diet these crops account for.

Maize	Lucerne	Triticale	Red clover	Whole-crop silage
% C167	% C168	% C169	% C170	% C172

50. How often do you or your adviser use bulls with a high Profitable Lifetime Index (PLI) when breeding dairy cows? Please tick **one** box only

Always	Most of the time	Some of the time	Rarely	Never
☐ C110	☐ C111	☐ C112	☐ C113	☐ C114

51. How often do you or your adviser use bulls or rams with a high Estimated Breeding Value (EBV) when breeding beef cattle or lambs? Tick **one** box in each row, if relevant.

	Always	Most of the time	Some of the time	Rarely	Never
Bulls	☐ C115	☐ C116	☐ C117	☐ C118	☐ C119
Rams	☐ C120	☐ C121	☐ C122	☐ C123	☐ C124

Section 10. Declaration

Signature ☐ V3 Date ☐

Name (please print) ☐ Telephone number ☐ V8

Time taken to complete this form ☐ minutes V1

E-mail address ☐ V5

Please enter any comments you may have on the figures provided. This may remove the need for us to contact you.

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