

Towards an understanding of beautiful feather cover in laying hens

A risk factor analysis of feather cover damage in laying hens on Canadian farms

**Laying farms
Risk factor questionnaire**

Please fill in the following questions to the best of your ability. Please print clearly when writing down your answers or tick the appropriate box as . Only provide one answer (i.e. tick one box) for each question, unless otherwise indicated. There are no right or wrong answers. If you would like to revise your answer, please draw a single horizontal line through the first answer and give your new answer as instructed. If at any point you need more space, you can use a blank sheet and clearly indicate to which question it relates.

1. Background information

Please fill in the current date (dd/mm/yy): _____

1. Please indicate how many year(s) of experience you have working in laying hen production:

- Less than 1 yr 1-4 yrs 5-10 yrs More than 10 yrs
 I don't know Prefer not to answer

2. Please indicate in which province/territory your farm is located:

- Nfld. Lab. P.E.I. N.S.
 N.B. Quebec Ontario
 Manitoba Sask. Alberta
 B.C. Yukon N.W.T.
 Nunavut I don't know Prefer not to answer

3. How many barns (a barn is defined as a hen house which houses one flock) are on your farm?

- 1 2 3 4 5 More than 5
 I don't know Prefer not to answer

4. Please give the total number of hens on your farm:

- Less than 1,000 1,000-5,000 5,000-10,000
 10,000-15,000 15,000-20,000 20,000-25,000
 More than 25,000 I don't know Prefer not to answer

5. Is your farm certified organic?

- Yes No I don't know Prefer not to answer

2. Barn information

Please answer the following questions for one barn, which houses the birds in an alternative housing system (i.e. enriched cages, single or multi-tier systems such as free-run or aviary housing, and free-range housing). This is also the barn where you will assess the birds for feather cover damage. Please answer all questions for the current flock.

6. What hatchery did your birds come from?

7. What rearing farm did your birds come from?

8. At what date were the birds placed in the barn (dd/mm/yy)? _____

9. How old were the birds when they were placed in the barn (wks)? _____

10. What is the current age of the birds in the barn (wks)? _____

11. How many birds were placed in the barn in total? _____

12. How many birds are currently in the barn? _____

13. What are the dimensions of your barn? length: _____ ft or m (*please circle*)*

width: _____ ft or m (*please circle*)

height: _____ ft or m (*please circle*)

**Please circle the unit of measurement you have used to express your answer.*

2.1 Housing

14. Please indicate the housing system of the barn:

Enriched/furnished cage [wire mesh enclosure with perches, nest and scratch area]

Single level indoor system [a non-cage system where birds are housed on only one level/tier e.g. free run]

Single level system – with outdoor access

Multi level indoor system [a non-cage system where birds are housed on multiple levels/tiers e.g. aviary]

Multi level system – with outdoor access

Other. Please specify: _____

I don't know

Prefer not to answer

Depending on your answer to question 14, please fill in the appropriate section below.

2.1.1 Enriched/furnished cage housing

(Only fill in this section if you selected the option for 'Enriched/furnished cage' in question 14)

15. How many cage rows are in your barn?

- 2 3 4 5 6 More than 6
 I don't know Prefer not to answer

16. How many cage levels/tiers are in your barn?

- 2 3 4 5 6 More than 6
 I don't know Prefer not to answer

17. Please indicate the manufacturer of the system:

18. Please indicate the model of the system:

19. Please indicate the age (years) of the system:

- Less than 1 yr old 1-4 yrs old 5-10 yrs old
 More than 10 yrs old I don't know Prefer not to answer

20. How many birds are housed per cage? _____ birds/cage

21. What are the dimensions of the cage? length: _____ in or cm (*please circle*)
width: _____ in or cm (*please circle*)
height: _____ in or cm (*please circle*)

22. Are perches provided?

- Yes No (Go to question 25) I don't know Prefer not to answer

23. Are elevated perches provided at varying heights?

- Yes No I don't know Prefer not to answer

24. Is there enough space for all birds to perch at the same time?

- Yes No I don't know Prefer not to answer

25. Is a scratch area provided?

- Yes No (Go to question 30) I don't know Prefer not to answer

26. What type of material is used for the scratch area?

- Smooth plastic Textured plastic Artificial grass (e.g. AstroTurf)
 Other. Please specify: _____
 I don't know Prefer not to answer

27. Is feed/litter scattered on the scratch area?

- Yes No (Go to question 29) I don't know Prefer not to answer

28. How often is feed/litter scattered on the scratch area?

- 1x per week Every other day 1x per day 2x per day
 Other. Please specify: _____
 I don't know Prefer not to answer

29. How often do you clean the scratch area during a production cycle?

- Never 1x per month 2x per month 1x per week
 Other. Please specify: _____
 I don't know Prefer not to answer

30. Is a nest area provided?

- Yes No (Go to question 32) I don't know Prefer not to answer

31. Does the nest area include any of the following? *Select all that apply.*

- Drinkers Feeders/feeder space Perches
 I don't know Prefer not to answer

32. Do you provide any form of environmental enrichment to the birds? *Select all that apply.*

- None (Go to question 35) Hanging objects (e.g. bottles, CDs, rope/string)
 Alfalfa/mineral blocks Other. Please specify: _____
 I don't know Prefer not to answer

33. At what age do you provide access to the environmental enrichment? _____ wks

34. Was there a specific event (e.g. cannibalism, high mortality) which motivated you to provide the birds with access to the environmental enrichment?

- Yes: _____ (please describe)
 No (providing enrichment is part of our standard practices)
 I don't know Prefer not to answer

35. Select any of the following if you have made major changes to the infrastructure of the barn (outside of routine changes) since the birds were placed. Please briefly describe the changes. *Select all that apply.*

- Cage dimensions: _____
 Feeders: _____
 Drinkers: _____
 Nest area: _____
 Perches: _____
 Enrichment: _____
 Litter/feed (scratchmats): _____
 Other: _____
 No changes made I don't know Prefer not to answer

Please go to section 2.2 Bird characteristics, p. 10

2.1.2 Non-cage systems

(Only fill in this section if you selected the option for 'Single level' or 'Multilevel system' in question 14)

36. How many levels/tiers are in your barn?

- 1 2 3 4 5 6 More than 6
 I don't know Prefer not to answer

37. Are resources (e.g. feed, water, nest area, perches) located on each level/tier?

- Yes – birds have access to all resources on each level/tier
- No – birds do not have access to all resources on each level/tier
- I don't know Prefer not to answer

38. Please indicate the manufacturer of the system:

39. Please indicate the model of the system:

40. Please indicate the age (years) of the system:

- Less than 1 yr old 1-4 yrs old 5-10 yrs old
- More than 10 yrs old I don't know Prefer not to answer

41. Are the birds partitioned or divided into smaller groups using migration fences or wire partitions?

- Yes No (Go to question 44) I don't know Prefer not to answer

42. How many sections are the birds divided into? _____

43. Are sections of the same size?

- Yes No I don't know Prefer not to answer

44. How many birds are housed in each section and what is the space available? *Fill in only section 1 if your barn is not divided into sections.*

- Birds in section 1 _____ Space of section 1 _____ sq.ft or m² (*please circle*)
- Birds in section 2 _____ Space of section 2 _____ sq.ft or m² (*please circle*)
- Birds in section 3 _____ Space of section 3 _____ sq.ft or m² (*please circle*)
- Birds in section 4 _____ Space of section 4 _____ sq.ft or m² (*please circle*)

45. Are perches provided?

- Yes No (Go to question 48) I don't know Prefer not to answer

46. Are elevated perches provided at varying heights?

- Yes No I don't know Prefer not to answer

47. Is there enough space for all birds to perch at the same time?

- Yes No I don't know Prefer not to answer

48. Is a nest area provided?

- Yes No (Go to question 52) I don't know Prefer not to answer

49. Is the nest area provided as single or group nests?

- Single nests Group nests I don't know Prefer not to answer

50. If you have a multi-tier system, are the nests located within the tiers?

- Yes No I don't know Prefer not to answer N/A

51. Is there a perch or platform provided in front of the nest area?

- Yes – perch Yes – platform
 No Other. Please specify: _____
 I don't know Prefer not to answer

52. What type of drinkers are used in the barn?

- Bell Nipple
 Troughs Other. Please specify: _____
 I don't know Prefer not to answer

53. What type of feeders are used in the barn?

- Troughs Chains
 Pan Hopper
 Other. Please specify: _____
 I don't know Prefer not to answer

54. Do you provide any form of environmental enrichment to the birds? *Select all that apply.*

- None (Go to question 57)
- Hanging objects (e.g. bottles, CDs, rope/string)
- Bales of hay/straw – on the floor
- Bales of hay/straw – hanging nets
- Alfalfa/mineral blocks
- Dustbaths (e.g. tire filled with sand or peat)
- Other. Please specify: _____
- I don't know
- Prefer not to answer

55. At what age do you provide access to the environmental enrichment? _____ wks

56. Was there a specific event (e.g. cannibalism, high mortality) which motivated you to provide the birds with access to the environmental enrichment?

- Yes: _____ (please describe)
- No (providing enrichment is part of our standard practices)
- I don't know
- Prefer not to answer

57. Select any of the following if you have made major changes to the infrastructure of the barn (outside of routine changes) since the birds were placed. Please briefly describe the changes. *Select all that apply.*

- Sections/partitions: _____
- Feeders: _____
- Drinkers: _____
- Nest area: _____
- Perches: _____
- Enrichment: _____
- Litter: _____
- Outdoor access/area: _____
- Other: _____
- No changes made
- I don't know
- Prefer not to answer

2.1.2.1 Litter management

58. Please select the description that best applies to your barn:

- All litter barn (Go to question 60)
- Combination of wire, slats and litter
- All wire/slatted barn (Go to Section 2.2 Bird characteristics, p. 10)
- I don't know
- Prefer not to answer

59. What proportion of the barn is covered with litter?

- Less than $\frac{1}{3}$ $\frac{1}{3}$ More than $\frac{1}{3}$
 I don't know Prefer not to answer

60. What type of litter is provided? *Select all that apply.*

- Sawdust Sand Wood shavings
 Straw – chopped Straw – long Straw - wheat
 Straw - barley Other. Please specify: _____
 I don't know Prefer not to answer

61. At what age did birds first gain access to the litter? _____ wks of age

62. If birds are restricted from access to litter, during which time of day do you restrict the birds' access? *Select all that apply.*

- 06:00-09:00 09:00-12:00 12:00-15:00
 15:00-18:00 18:00-21:00 Other. Please specify: _____
 N/A I don't know Prefer not to answer

63. Do you scatter anything (e.g. grain/grit) to encourage 'working' of the litter?

- Yes _____ (please specify what) No
 I don't know Prefer not to answer

64. What approximate depth is the litter currently kept at? _____ in or cm (*please circle*)

65. Have you replaced/replenished the litter since the birds first gained access to the litter?

- Yes, if so how many times? _____ No
 I don't know Prefer not to answer

66. How often do you rake/fork/rotate the litter (i.e. breaking up of the litter) for the current flock?

- Never Monthly Weekly Daily
 Other. Please specify: _____ I don't know Prefer not to answer

2.2 Bird characteristics

67. Please indicate the feather colour of the birds in the barn. *Select all that apply:*

- | | |
|---------------------------------------|---|
| <input type="checkbox"/> Brown hens | <input type="checkbox"/> White hens |
| <input type="checkbox"/> Silver hens | <input type="checkbox"/> Other. Please specify: _____ |
| <input type="checkbox"/> I don't know | <input type="checkbox"/> Prefer not to answer |

68. Please indicate the breed(s) of the birds in the barn. *Select all that apply:*

- | | |
|---------------------------------------|---|
| <input type="checkbox"/> Babcock | <input type="checkbox"/> Bovans |
| <input type="checkbox"/> Dekalb | <input type="checkbox"/> Hisex |
| <input type="checkbox"/> H&N | <input type="checkbox"/> Hy-Line |
| <input type="checkbox"/> ISA | <input type="checkbox"/> Lohmann |
| <input type="checkbox"/> Shaver | <input type="checkbox"/> Other. Please specify: _____ |
| <input type="checkbox"/> I don't know | <input type="checkbox"/> Prefer not to answer |

69. If known, please indicate the specific breed(s) of the birds in the barn. *Select all that apply:*
Breeds are grouped by feather colour and alphabetic order

- | | |
|---|---|
| <input type="checkbox"/> Babcock Brown | <input type="checkbox"/> Bovans Brown |
| <input type="checkbox"/> Dekalb Brown | <input type="checkbox"/> Hisex Brown |
| <input type="checkbox"/> H&N Brown Nick | <input type="checkbox"/> Hy-Line Brown |
| <input type="checkbox"/> ISA Brown | <input type="checkbox"/> Lohmann Brown Classic |
| <input type="checkbox"/> Lohmann Brown Extra | <input type="checkbox"/> Lohmann Brown Lite |
| <input type="checkbox"/> Lohmann Brown Plus | <input type="checkbox"/> Lohmann Tradition |
| <input type="checkbox"/> Shaver Brown | |
|
 | |
| <input type="checkbox"/> Babcock White | <input type="checkbox"/> Bovans White |
| <input type="checkbox"/> Dekalb White | <input type="checkbox"/> Hisex White |
| <input type="checkbox"/> H&N Crystal Nick | <input type="checkbox"/> H&N Nick Chick |
| <input type="checkbox"/> H&N Super Nick | <input type="checkbox"/> Hy-Line W-36 |
| <input type="checkbox"/> Hy-Line W-80 | <input type="checkbox"/> ISA White |
| <input type="checkbox"/> Lohmann LSL Classic | <input type="checkbox"/> Lohmann LSL Extra |
| <input type="checkbox"/> Lohmann LSL Lite | <input type="checkbox"/> Lohmann LSL Ultra Lite |
| <input type="checkbox"/> Shaver White | |
|
 | |
| <input type="checkbox"/> Dekalb Amberlink | <input type="checkbox"/> H&N Coral Nick |
| <input type="checkbox"/> Hy-Line Silver Brown | <input type="checkbox"/> Hy-Line Sonia/Gray |

- | | |
|---|---|
| <input type="checkbox"/> Lohmann Dual | <input type="checkbox"/> Lohmann Sandy |
| <input type="checkbox"/> Lohmann Silver | <input type="checkbox"/> Other. Please specify: _____ |
| <input type="checkbox"/> I don't know | <input type="checkbox"/> Prefer not to answer |

2.3 Rearing and placement

70. Where do you source your birds from?

- Home-reared Rearing supplier I don't know Prefer not to answer

71. Did you visit the birds during rear?

- Yes No I don't know Prefer not to answer

72. Did all birds in the barn come from the same rearing flock?

- Yes No I don't know Prefer not to answer

73. In which type of housing were the pullets raised?

- Conventional cage [wire mesh enclosure without perches, nest and scratch area]
 Enriched/furnished cage [wire mesh enclosure with perches, nest and scratch area]
- Single level indoor system [a non-cage system where birds are housed on only one level/tier e.g. free run]
 Single level system – with outdoor access
- Multi level indoor system [a non-cage system where birds are housed on multiple levels/tiers e.g. aviary]
 Multi level system – with outdoor access
- Other. Please specify: _____
 I don't know Prefer not to answer

74. Are your birds beak trimmed?

- Yes, at _____ days or weeks (*please circle*)
 No (Go to question 76) Retrospectively
 Repeat Other. Please specify: _____
 I don't know Prefer not to answer

75. Please indicate what method of beak trimming was used and how much was trimmed:

- Hot blade beak trimming: $\frac{1}{4}$ or $\frac{1}{3}$ or $\frac{1}{2}$ of beak length trimmed (*please circle*)
- Infrared beak trimming: $\frac{1}{4}$ or $\frac{1}{3}$ or $\frac{1}{2}$ of beak length trimmed (*please circle*)
- Other. Please specify: _____
- I don't know Prefer not to answer

76. Did you see any of the following when your birds arrived? *Select all that apply.*

- Birds with varying body size
- Birds with leg injuries
- Birds with blood visible on their body
- Birds with feather damage/naked spots on the head
- Birds with feather damage/naked spots on the back
- Other. Please specify: _____
- None of the above I don't know Prefer not to answer

77. For this flock, did you aim to match the conditions in your barn to the conditions in which birds are kept during rear?

- Yes No (Go to question 79) I don't know Prefer not to answer

78. If yes, in what way(s) did you try to match conditions? *Select all that apply.*

- | | |
|--|---|
| <input type="checkbox"/> Housing type (e.g. cage, free-run, aviary) | <input type="checkbox"/> Drinker type |
| <input type="checkbox"/> Drinker height | <input type="checkbox"/> Feeder type |
| <input type="checkbox"/> Feeder height | <input type="checkbox"/> Time feeders are run |
| <input type="checkbox"/> Feed structure (e.g. mashed, pelleted etc.) | <input type="checkbox"/> Time lights on and off |
| <input type="checkbox"/> Type of light bulbs | <input type="checkbox"/> Perch access and/or type |
| <input type="checkbox"/> Litter access and/or type | <input type="checkbox"/> Other. Please specify: _____ |
| <input type="checkbox"/> I don't know | <input type="checkbox"/> Prefer not to answer |

2.4 Flock health

79. How many times per day are the birds inspected at their current age?

- 1x 2x 3x 4x 5x More than 5x
- I don't know Prefer not to answer

80. Please indicate how many workers inspect the current flock on a daily basis:

- 1 2 3 4 5 More than 5
 I don't know Prefer not to answer

81. Do you inspect the top and bottom tier during inspections of the current flock?

- Never Sometimes About half of the time Most of the time
 Always I don't know Prefer not to answer

82. On average how long do you spend inspecting the current flock per day?

- Less than 15 min 15-30 min 30-45 min 45-60 min More than 60 min
 I don't know Prefer not to answer

83. Do you vary the route taken through the house during inspections of the current flock?

- Yes No I don't know Prefer not to answer

84. How often do you pick up an individual bird during an inspection of the current flock?

- Never Sometimes About half of the time Most of the time
 Always I don't know Prefer not to answer

85. What do you look for during inspections? *Select all that apply.*

- Dead birds Sick birds
 Birds with leg injuries Birds with blood visible on their body
- Birds with feather damage/naked spots on the head
 Birds with feather damage/naked spots on the back
- Birds with varying body size Birds are evenly distributed within the cage/barn
 Behaviour of the birds Pile-up/smothering
 Vocalization of the birds Feather eating from the floor
- Floor/system eggs (i.e. eggs laid outside of the nest)
 Malfunctioning feeders/drinkers
 Malfunctioning ventilation/temperature systems
 Malfunctioning lighting systems

- Litter quality (e.g. wet litter, litter depth)
- Feathers in the litter
- Other. Please specify: _____
- I don't know Prefer not to answer

86. Have you noticed a higher amount of feathers than usual in the litter of this flock?

- Yes
- No
- I don't know
- Prefer not to answer

87. Have you noticed birds eating feathers from the floor in this flock?

- Yes
- No
- I don't know
- Prefer not to answer

88. Have you seen birds with feather damage/naked spots on the head in the current flock?

- Yes, from _____ wks of age
- No (Go to question 91)
- I don't know
- Prefer not to answer

89. Please briefly explain why you think this is occurring:

90. Have any changes been made in the management of the birds to try and address this? Please briefly describe the changes. *Select all that apply.*

- Beak trimming: _____
- Lower light intensity: _____
- Changed feed composition: _____
- Change in stocking density: _____
- Change in enrichment: _____
- Change in litter management: _____
- Other. Please specify: _____
- No changes made I don't know Prefer not to answer

91. Have you seen birds with feather damage/naked spots on the back in the current flock?

- Yes, from _____ wks of age
- No (Go to question 94)
- I don't know
- Prefer not to answer

92. Please briefly explain why you think this is occurring:

93. Have any changes been made in the management of the birds to try and address this? Please briefly describe the changes. *Select all that apply.*

- Beak trimming:_____
- Lower light intensity:_____
- Changed feed composition:_____
- Change in stocking density:_____
- Change in enrichment:_____
- Change in litter management:_____
- Other:_____
- No changes made I don't know Prefer not to answer

94. How do birds in the current flock react to you when you first enter the barn?

- No reaction Run away Flighty/pile-up Crowd around
- Other. Please specify:_____
- I don't know Prefer not to answer

95. How do birds in the current flock react to you when you are standing still?

- No reaction Run away Flighty/pile-up Crowd around
- Other. Please specify:_____
- I don't know Prefer not to answer

96. Please indicate how often veterinary practitioners visit the current flock in your laying facility:_____times/year

97. Have you developed and implemented a flock health plan with your vet?

- Yes No I don't know Prefer not to answer

98. Did you clean and disinfect the barn before the birds arrived?

- Yes No I don't know Prefer not to answer

99. Do you use dedicated clothing and/or clean boot dips for the barn?

- Yes No I don't know Prefer not to answer

100. Have you re-vaccinated your birds since placement?

- Yes: _____ (please specify for what)
 No
 Other. Please specify: _____
 I don't know Prefer not to answer

101. Were any of the following problems observed in the flock since placement? *Select all that apply.*

- Avian rhinotracheitis Coccidiosis
 E. coli Eggbound
 Egg peritonitis Infectious bronchitis
 Layer fatigue Lice
 Marek's disease Mites
 Necrotic enteritis Worms
 Other. Please specify: _____
 None I don't know Prefer not to answer

102. What is the total number of birds that have died since placement?

_____ birds
_____ % cumulative mortality

103. Please rank the 3 main causes of culling/mortality from the most [1] to the least common [3] (*max 3 options*):

- ____ Trapped in housing equipment (e.g. caught in feeder)
____ Smothering (i.e. pile-up or crowding of birds)
____ Heat/cold stress
____ Cannibalism (i.e. death due to excessive pecking by other birds)
____ Disease/illness. Please specify: _____
____ Leg injuries
____ Prolapse
____ Other. Please specify: _____
 I don't know Prefer not to answer

110. Do you use midnight feeding for the current flock?

- Yes No I don't know Prefer not to answer

111. Has the feeder system had any breakdowns/problems resulting in feed restriction since the birds were placed? If so, how many times?

- Yes, 1-3x Yes, 4-6x Yes, more than 6x
 No I don't know Prefer not to answer

112. Has the drinker system had any breakdowns/problems resulting in water restriction since the birds were placed? If so, how many times?

- Yes, 1-3x Yes, 4-6x Yes, more than 6x
 No I don't know Prefer not to answer

113. Did/do you provide any of the following feed supplements to the current flock? *Select all that apply.*

- Insoluble grit (e.g. sand)
 Insoluble fibre (e.g. whole oats, wheat, corn, alfalfa, maize/barley/pea silage etc.)
 Oyster shell
 Vitamins
 Other. Please specify: _____
 No supplements provided
 I don't know Prefer not to answer

114. Do you have any animal by-products in your ration?

- Yes No I don't know Prefer not to answer

2.6 Lighting

115. Please indicate which type of lighting is provided in the barn:

- Incandescent Fluorescent LED
 Other. Please specify: _____ Natural light (i.e. windows)
 I don't know Prefer not to answer

116. Please indicate the number of hours of light birds are on: _____ h/day
Time on: _____ [hh:mm] off: _____ [hh:mm]

117. Do you provide a dawn/dusk lighting period for the current flock?
- Yes No (Go to question 119) I don't know Prefer not to answer
118. Please indicate how dawn/dusk is achieved:
- Natural light (i.e. windows) All lights dimmed automatically
 Gradual dimming by area Other. Please specify: _____
 I don't know Prefer not to answer
119. Please indicate what the average light intensity is (lux) at bird height on the lowest level/tier
- Less than 5 lux 5-10 lux 11-15 lux 16-20 lux
 21-25 lux More than 25 lux I don't know Prefer not to answer
120. Is light intensity even throughout the barn (i.e. no darker areas)?
- Even Somewhat even Somewhat uneven
 Uneven I don't know Prefer not to answer
121. Do you use the management guidelines for your breed of birds for the lighting system?
- Yes No I don't know Prefer not to answer

2.7 Air quality

122. Please indicate what type of ventilation system is used
- Controlled (fan) All natural
 Mixed (fan and natural) Other. Please specify: _____
 I don't know Prefer not to answer
123. Please indicate the temperature (°C) setting in the barn: _____
124. Please indicate the relative humidity (%RH) setting in the barn: _____
125. Has the concentration of ammonia ever reached intolerable levels (above 20-25 ppm, i.e. irritable to eyes or airways) since placement of the birds in the barn?
- Yes No I don't know Prefer not to answer

126. How often do you remove the manure from the barn (e.g. by manure belt/scrapper(s))?

- 1x per day 3x per week 2x per week 1x per week
 Other. Please specify: _____
 I don't know Prefer not to answer

127. Has the concentration of dust ever reached intolerable levels (i.e. irritable to eyes or airways) since placement of the birds in the barn?

- Yes No I don't know Prefer not to answer

128. Do you follow the management guidelines for your breed of birds for air quality?

- Yes No I don't know Prefer not to answer

2.8 Outdoor access and range use

(Only fill in this section if you selected an option 'with outdoor access' in question 14)

129. What type of outdoor access do you provide to the birds?

- Covered veranda [roof covered barn extension] Free range area
 I don't know Prefer not to answer

130. Please indicate the age of the birds when they were first allowed outside: _____ wks

131. What is the size of the range birds have access to? _____ hectare

132. Please indicate the proportion of the range that is regularly used: _____%

133. Please indicate the proportion of the birds that use the range: _____%

134. Which phrase best describes how your birds use the range?

- Stay near the barn
 Stay near the outdoor structures (e.g. artificial/natural shelters)
 Use less than half of the outdoor area
 Use more than half of the outdoor area
 Use the entire outdoor area
 I don't know Prefer not to answer

135. What is the number of openings to the range area?
- 1-3 4-5 More than 5 I don't know Prefer not to answer
136. Are the openings to the range area evenly distributed along the barn?
- Yes No I don't know Prefer not to answer
137. Which of the following do you provide to the birds in the outdoor area? *Select all that apply.*
- Feed/feeders
 Water/drinkers
 Artificial shelter (e.g. sheds, old farm equipment)
 Natural shelter (e.g. shrubs, trees)
 Nest area(s)
 Dustbathing area(s)
 Perches
 None Other. Please specify: _____
 I don't know Prefer not to answer
138. Do you rotate the outdoor area during the time it is in use (during a laying cycle)?
- Yes – 1x Yes – 2x Yes – 3x No
 Other. Please specify: _____
 I don't know Prefer not to answer
139. Do you rotate the outdoor area for each new flock?
- Yes No I don't know Prefer not to answer
140. Do you have, or have you had problems with predators in the current flock?
- Yes No I don't know Prefer not to answer

2.9 Egg production and flock performance

141. Please indicate the age of the birds when day length was increased: _____wks

142. When did your birds start lay?

- Before 19 wks of age At 19 wks of age After 19 wks of age
 I don't know Prefer not to answer

143. How many eggs are collected per day in this barn? _____eggs/day

144. What is the percentage of floor and system eggs (i.e. outside the nest) in this barn? _____%

145. Do you have a problem with egg eating in this barn?

- Yes No I don't know Prefer not to answer

146. Please indicate how performance of the birds compares with the breed standards/targets:

	Below target	On target	Above target	I don't know	Prefer not to answer
No. of eggs produced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Body weight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feed consumption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mortality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

147. What is the current egg production of the birds? _____production rate (%)

148. What was the age of the birds at 50% rate of lay? _____wks

149. What was the age of the birds at peak production? *Only answer if birds have reached peak production* _____wks

150. What was the peak production of the birds? *Only answer if birds have reached peak production* _____production rate (%)

151. Please indicate the average feed consumption: _____gr/day/bird

3. Demographics and other information

152. Please indicate your gender:

- Female Male Other. Please specify: _____
 I don't know Prefer not to answer

153. Please indicate your age (years):

- 18-24 25-34 35-44 45-54 55-64
 65 and above Prefer not to answer

154. Have you completed specific laying hen-related training/course(s)?

- Yes – 1 course/training Yes – 2 to 3 courses/trainings
 Yes – more than 3 courses/trainings No
 I don't know Prefer not to answer

155. Please indicate your main sources of information/advice on egg production. *Select all that apply.*

- Veterinarians Laying hen specialists/advisors/inspectors
 Other egg producers Management/co-workers
 Industry organizations/meetings/journals
 Research organizations/meetings/journals
 Internet Other. Please specify: _____
 I don't know Prefer not to answer

156. Would you be willing to participate in future research?

- Yes No I don't know