

1 Appendix III: Inputs for the economic module of the simulation model

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3 Economic input changes per measure for improvement of animal welfare:

4 PM1: Camera surveillance farrowing pen

5 - Piglet mortality is estimated to decrease with 1% with the extra supervision.

6 - Feed intake sow increases because of piglet mortality decrease. Food intake is 1165 kg/sow/year with piglet mortality of 13% (i.e.
7 28.33 weaned piglets per year). With 12% piglet mortality, food intake is 1178.57 kg/sow/year.

8 - The costs for cameras are calculated based on prices charged by a company (cameraindestal.nl, 2014) in the Netherlands. This
9 company charges €500 for the first camera and €200 for each next camera, including installation. The depreciation time of the
10 cameras was estimated at 15 years.

11 - Extra labor needed to look at the camera footage and to assist piglets in need is estimated at 0.06 hours/sow/year.

12

13 PM2: Jute sack provision sow

14 - Piglet mortality decreases with 0.8% when the sow is provided with two jute sacks (Hoofs, 2012).

15 - Feed intake sow increases because of piglet mortality decrease. Food intake is 1165 kg/sow/year with piglet mortality of 13% (i.e.
16 28.33 weaned piglets per year). With 12.2% piglet mortality, food intake is 1175.69 kg/sow/year.

17 - Cost for one jute sack is €0.90 (expert). One sow needs on average 4.72 (2*2.36) jute sacks per year. A sack holder costs €5 (expert)
18 and is estimated to have a depreciation period of 15 years.

19 - Extra labor needed to install sack holders and to place jute sacks in the farrowing pens is estimated at 0.036 hours/sow/year.

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21 PM3: Straw provision sow

22 - Piglet mortality is estimated to decrease with 0.6% with straw provision.

23 - Feed intake sow increases because of piglet mortality decrease. Feed intake is 1165 kg/sow/year with piglet mortality of 13% (i.e.
24 28.33 weaned piglets per year). With 12.4% piglet mortality, feed intake is 1173.22 kg/sow/year.

25 - The costs for the floor element that has to be replaced is estimated at €40 per element with a depreciation period of 15 years.

26 - Prices for straw were around €35 for 320 kg (marktplaats.nl, 2014).

27 - Extra labor needed for other tasks (providing straw) was estimated at 0.0066 hours/sow/year.

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29 PM4: Sow habituation

30 - Piglet mortality is estimated to decrease with 0.6% with sow habituation.

31 - Feed intake sow increases because of piglet mortality decrease. Feed intake is 1165 kg/sow/year with piglet mortality of 13% (i.e.
32 28.33 weaned piglets per year). With 12.4% piglet mortality, feed intake is 1173.22 kg/sow/year.

33 - Extra labor needed to habituate sows is estimated at 0.10 hours/sow/year.

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35 TB1: Tail docking with analgesia

36 - The costs for piglet analgesia were around €32 per 100 ml (veterinarian). The price of a needleless injection gun was around €200
37 (schippers.nl, 2014). The depreciation period of such an injection gun was estimated at 15 years.

38 - Extra labor needed to inject piglets with an analgesia is estimated at 0.09 hours/sow/year.

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40 TB2: Biting material for weaned piglets

41 - The total costs for enrichment were calculated to be €0.85 sow/year.

42 - Extra costs for health care were estimated at €1.13 sow/year. These costs increase because tail biting will occur more often. We
43 estimated that 4% of the piglets that are bitten need health care.

44 - Extra labor needed to install distance holders, renew and replace enrichment was estimated at 0.24 hours/sow/year.

45 - Extra labor needed to clean pens was estimated at 0.0014 hours/sow/year.

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47 TB3: Straw playing area for weaned piglets

48 - Floor replacement was estimated to be €0.33 sow/year.

49 - Price for straw was around €35 for 320 kg (marktplaats.nl, 2014).

50 - Extra costs for health care were estimated at €0.85 sow/year. These costs increase because tail biting will occur more often. We
51 estimated that 3% of the piglets that are bitten need health care.

- 52 - Extra labor needed to clean pens was estimated at 0.090 hours/sow/year.
- 53 - Extra labor needed for other tasks (providing straw) was estimated at 0.15 hours/sow/year.
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- 55 TB4: Chopped straw provision for weaned piglets
- 56 - Prices for straw were around €6.00 for 20 kg (stronet.nl, 2014).
- 57 - Extra costs for health care were estimated at €0.71 sow/year. These costs increase because tail biting will occur more often. We
- 58 estimated that 2.5% of the piglets that are bitten need health care.
- 59 - Extra labor needed for other tasks (providing straw) was estimated at 0.15 hours/sow/year.
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- 61 IH1: Free range outside area
- 62 - The costs for pen changes was estimated at €7.31 sow/year.
- 63 - A decrease of €6.9 sow/year (10%) in health care was expected because of the positive effect of the measure on animal welfare.
- 64 - Extra labor needed to clean sow stables was estimated at 0.15 hours/sow/year.
- 65
- 66 IH2: Straw provision
- 67 - Prices for straw were around €35 for 320 kg (marktplaats.nl, 2014).
- 68 - A decrease of €4.83 sow/year (7%) in health care was expected because of the positive effect of the measure on animal welfare.
- 69 - Extra labor needed to clean sow stables was estimated at 0.075 hours/sow/year.
- 70 - Extra labor needed for other tasks (providing straw) was estimated at 0.15 hours/sow/year.
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- 72 IH3: Straw provision and daylight
- 73 - The costs for pen changes was estimated at €2.50 sow/year.
- 74 - Prices for straw were around €35 for 320 kg (marktplaats.nl, 2014).
- 75 - Because of the window less artificial light is necessary. We estimated a decrease in lighting costs of €0.95 sow/year.

- 76 - Because of the windows, heating will change. It is assumed that heating costs on average will be the same because when the sun is
77 shining less heating is necessary and when it is cold and cloudy more heating is necessary.
- 78 - A decrease of €4.14 sow/year (6%) in health care was expected because of the positive effect of the measure on animal welfare.
- 79 - Extra labor needed to clean sow stables was estimated at 0.075 hours/sow/year.
- 80 - Extra labor needed for other tasks (providing straw) was estimated at 0.15 hours/sow/year.
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- 82 IH4: Straw provision, daylight and increased group size
- 83 - The costs for pen changes was estimated at €12.74 sow/year.
- 84 - Prices for straw were around €35 for 320 kg (marktplaats.nl, 2014).
- 85 - Because of the windows, less artificial light is necessary. We estimated a decrease in lighting costs of €0.95 sow/year.
- 86 - Because of the windows, heating will change. It is assumed that heating costs on average will be the same because when the sun is
87 shining less heating is necessary and when it is cold and cloudy more heating is necessary.
- 88 - A decrease of €6.21 sow/year (9%) in health care was expected because of the positive effect of the measure on animal welfare.
- 89 - It is assumed that less time is needed to clean sow stables because of bigger pens without free access stables. The less labor needed
90 was estimated at 0.23 hours/sow/year.
- 91 - Labor needed for other tasks was kept the same as for the reference farm because providing straw takes extra time but the change
92 of system will save time.