



PIGLOW and EBENE: Development and on farm testing of apps for animal welfare self-assessments

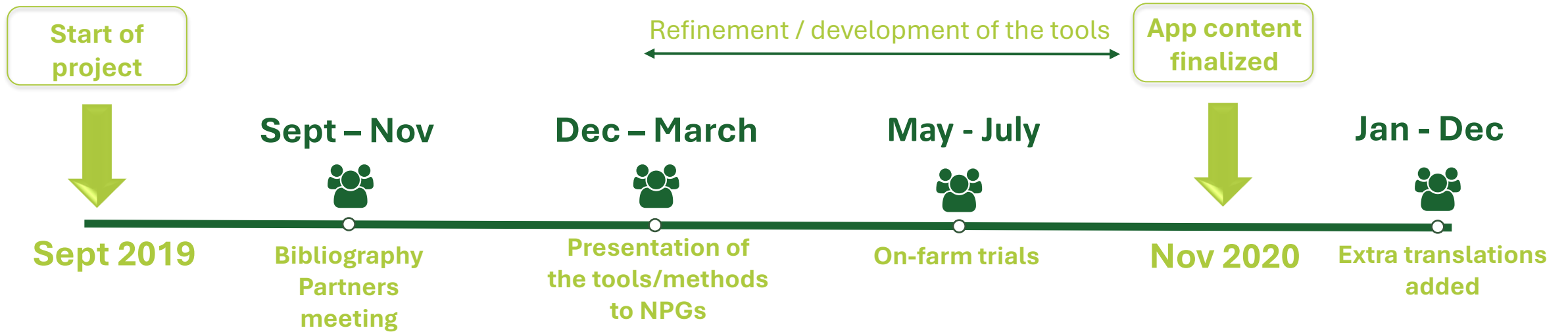
Evelien Graat (ILVO)



PPILOW Final conference – Africa Museum, Tervuren (Brussels)

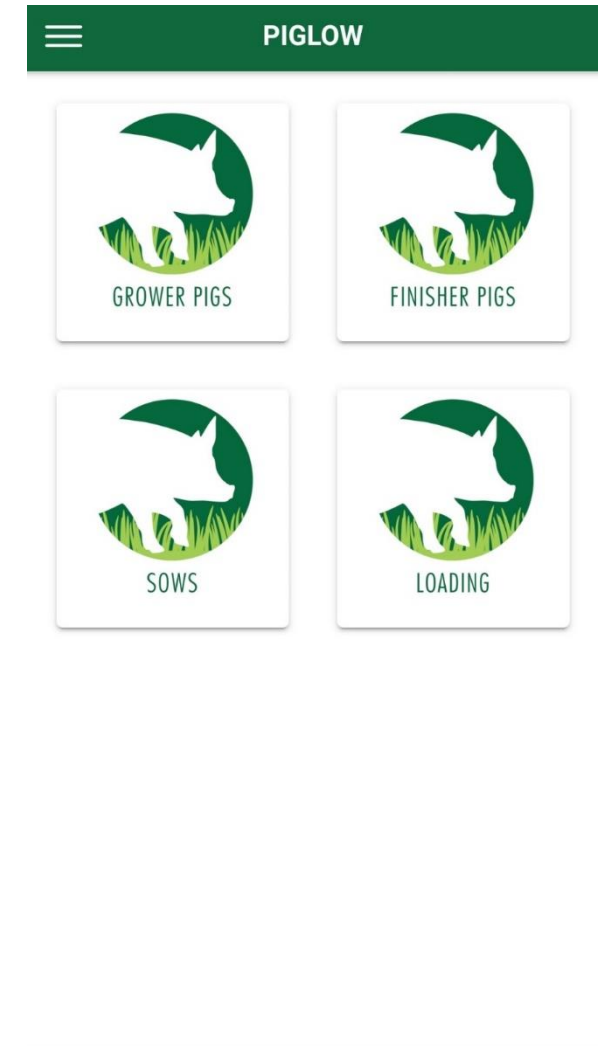
11th-12th June 2024

Development of self-assessment apps



PIGLOW and EBENE

- Animal welfare assessments by free-range and organic pigs and poultry farmers
- Animal based welfare indicators
- Automated feedback on results: tips for improvements per welfare indicator
- Benchmarking
- Meant to sensitize farmers towards possible welfare issues
- Available in Dutch, Danish, English, Finnish, French, German, Italian (+ Romanian and Norwegian for PIGLOW)

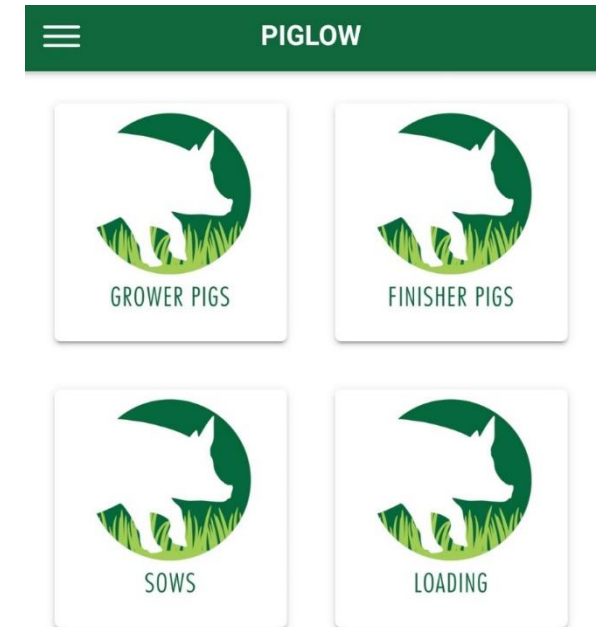


Questionnaires for:

- Grower pigs
- Finishers pigs
- Sows (pregnant, farrowing, management)
- Loading process

Group and/or individual observations

Observations can be done indoors or outdoors



Good food

← Questionnaire

29%

Group observations

1/5

Might some animals in the group have **difficulties accessing** good quality **drinking water** at some point in time? ⓘ

Yes

No



Good health

← Questionnaire

32%

Group observations

1/5

How many pigs display **laboured breathing (pumping)**?



2



Good housing

← Questionnaire

26%

Group observations

1/5

Observe how the pigs are **distributed** throughout the pen. ⓘ

A. huddling (more than 50% of the pigs) ⓘ

Yes

No

B. widely spread on their **flank** (more than 50% of the pigs)

Yes

No



Appropriate behaviour

← Questionnaire

36%

Group observations

1/5

Record the **time** (in seconds) it requires before the **first pig approaches and touches you** (after entering the pen)? If **no pig touches you** within **60 seconds**, end the test and continue with the next question. See the **i-icon** for info about this test. ⓘ

0:00:00

▶ PLAY



Scores

Appropriate Behaviour

Description

confidence in humans (average approach time) [i](#)

pigs using the enrichment [i](#)

pigs with at least 15 scratches on one side [i](#)

pigs with ear lesions [i](#)

pigs with tail lesions [i](#)

Answers/Score

30,5 sec

13,5 %

0 %

0 %

0 %

Benchmarking based on percentile [i](#)

P24

P24

P18 - P100

P41 - P100

P18 - P100

Appropriate Behaviour

Description	Answers/Score
confidence in humans (average approach time) i	30,5 sec
pigs using the enrichment i	13,5 %
pigs with at least 15 scratches on one side i	0 %
pigs with ear lesions i	0 %
pigs with tail lesions i	0 %

Benchmarking

Benchmarking based on percentile [i](#)

P24

P24

P18 - P100

P41 - P100

P18 - P100

Appropriate Behaviour

Description

confidence in humans (average approach time) ⓘ

pigs using the enrichment ⓘ

pigs with at least 15 scratches on one side ⓘ

pigs with ear lesions ⓘ

pigs with tail lesions ⓘ

Risk Factor

Tail lesions, which are usually caused by bites from another pig, can be painful and can also lead to infections, which form a health risk.

In addition, the presence of these lesions points to problems in the biter (stress, behavioural problems or feeding problems). Providing the animals with enrichment could help to reduce behavioural problems by reducing boredom. One element of the feed that has been associated with biting is a mineral deficiency.

Risk factors

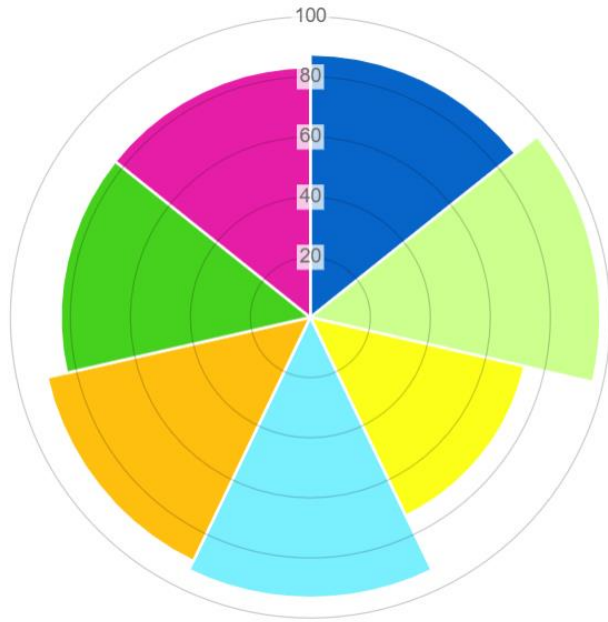
- Stress
- Not enough or unsuitable enrichment
- Feeding competition
- Composition of the feed (e.g. mineral deficiency)

More information on all welfare indicators can be found in the manual which is available on <https://www.piglow.eu/Home/Questionnaires>

Close

PIGLOW - Results

Welfare Radar

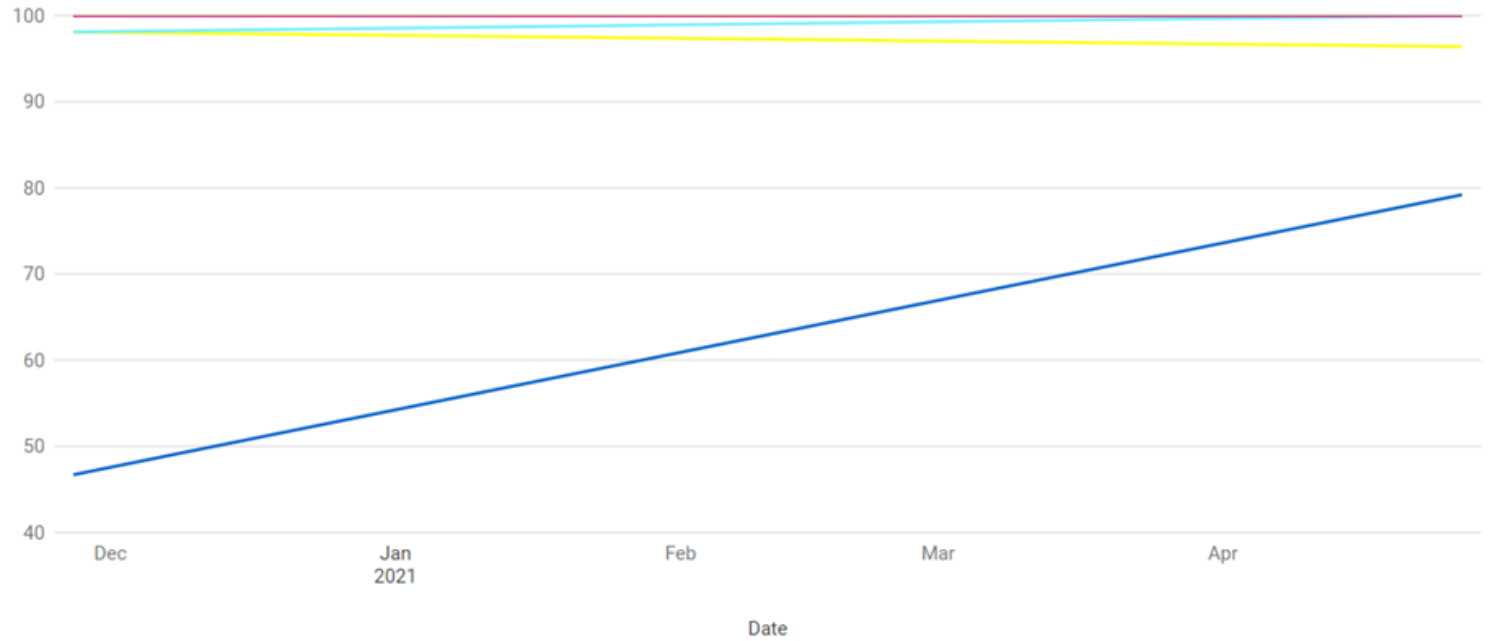


Legend

Benchmark

- Confidence in humans [i](#)
- Absence of tail lesions [i](#)
- Absence of faeces/manure on skin [i](#)
- Absence of lameness [i](#)
- Absence of laboured breathing [i](#)
- Absence of panting and shivering [i](#)
- Absence of ear lesions [i](#)

Evolution



Questionnaires for:

- Broilers (indoor and free range)
- Layer hens (indoor and free range)
- Turkeys, guinea fowl, quails, rabbits (indoor)

Online questionnaire on loading process
Specific section for outdoor observations

The screenshot shows a mobile application interface for 'New evaluation'. At the top, there is an orange header with a back arrow and the text 'New evaluation'. Below the header, there is a list of animal types with icons and expandable sections. The first item is 'Broiler' with a chicken icon and an upward arrow. Below it, there are two expandable sections: 'Free range' and 'Indoors', both with a light beige background. The next item is 'Hen' with a chicken icon and a downward arrow. Below that is 'Turkey' with a chicken icon and a downward arrow. Then 'Guinea Fowl' with a chicken icon and a downward arrow. Next is 'Quail' with a quail icon and a downward arrow. Finally, 'Rabbit' with a rabbit icon and a downward arrow. Each item is separated by a thin horizontal line.

EBENE - Content

Behavioral assessment

Definition of the terms

4:28 Stop

1	Dust bath	-	0	+
2	Grooming	-	2	+
3	Exploration	-	8	+
4	Stretching / wing flapping	-	4	+
5	Aggressive pecking	-	1	+
6	Interaction	-	2	+

Sanitary assessment:

Transect assessment

Transect width (m)
2.5

1	Small	-	1	+
2	Injured	-	0	+
3	Still	-	2	+
4	Lame	-	1	+
5	Dead	-	0	+
6	Other anomalies	-	0	+

Free range assessment

Weather

Entrance

1. In the center

2. Return on the side

0 50 100

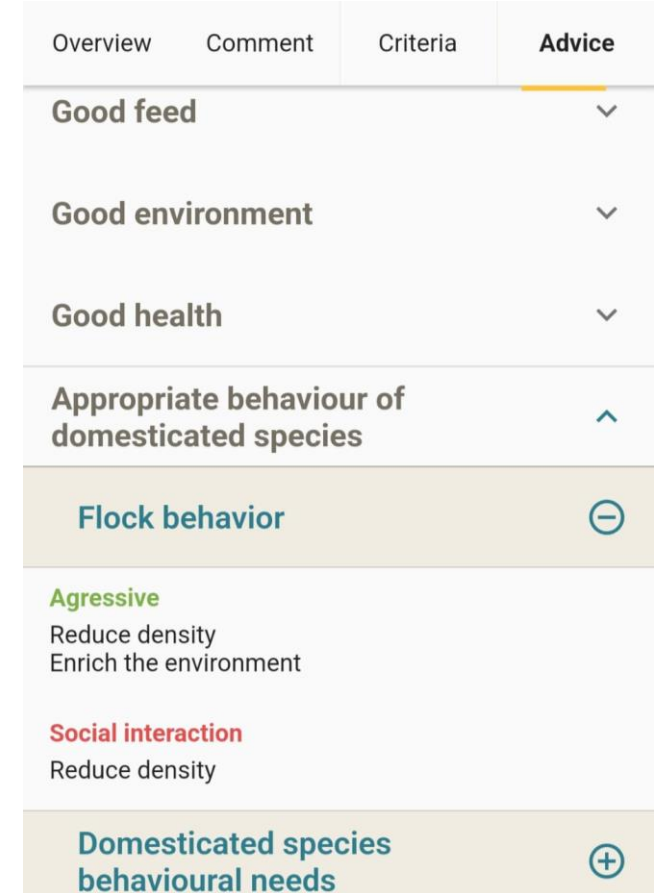
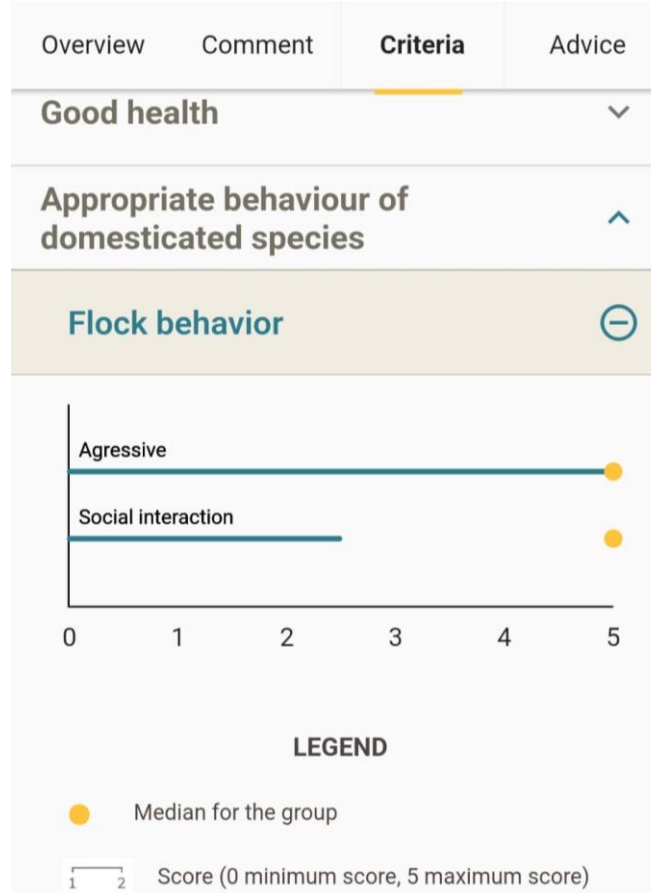
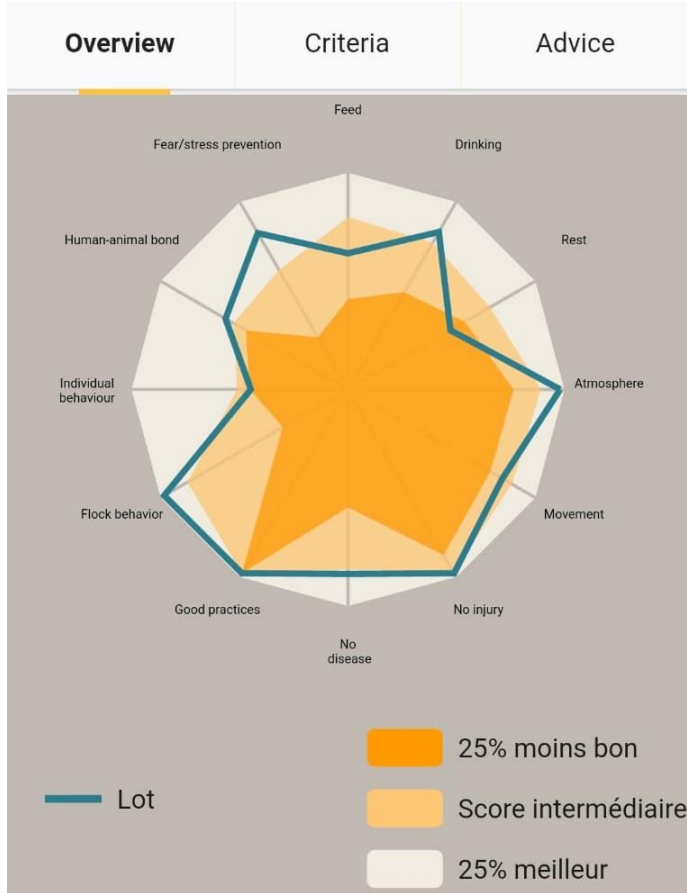
LEGEND

- Building
- Feeders
- Drinkers
- Transects

After each observation:

- Distance from humans
- Resting, panting, enrichment use
- Footpad dermatitis

EBENE - Results



PIGLOW and EBENE in the press

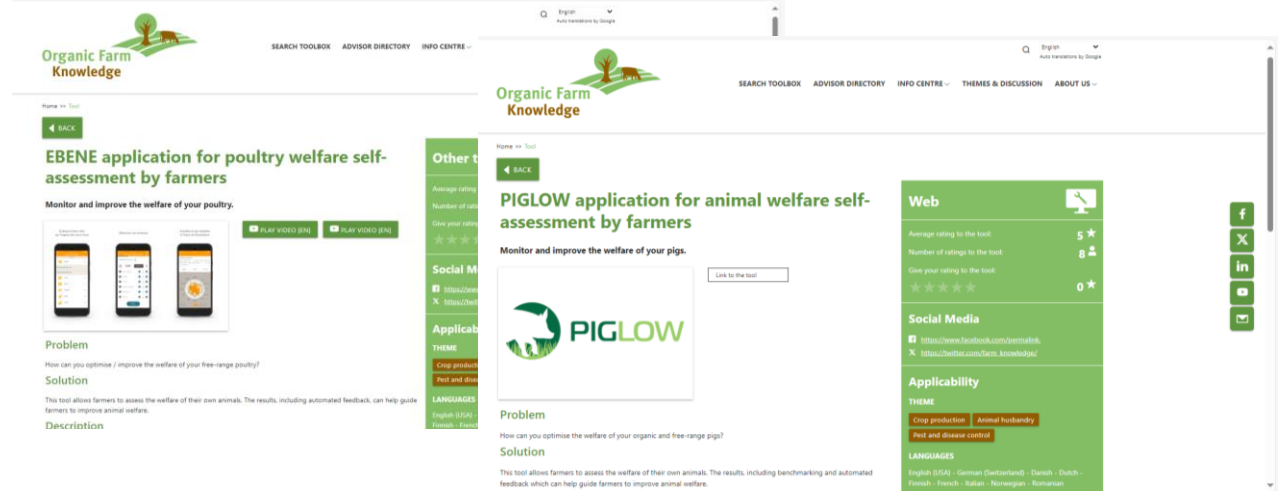
PIGLOW

- 1 newspaper article
- 4 presentations at professional events
- 4 conference presentations
- Training sessions
- Many mentions in newsletters, on websites, etc.
- Video with farmer testimonial



EBENE

- 10 newspaper/magazine articles
- 2 articles in a conference journal
- 7 presentations at professional events
- 3 conference presentations
- 1 yearly meeting with app users
- Training sessions
- Many mentions in newsletters, on websites, etc.
- Video with farmer testimonial



Farmer testimonial - PIGLOW

PIGLOW

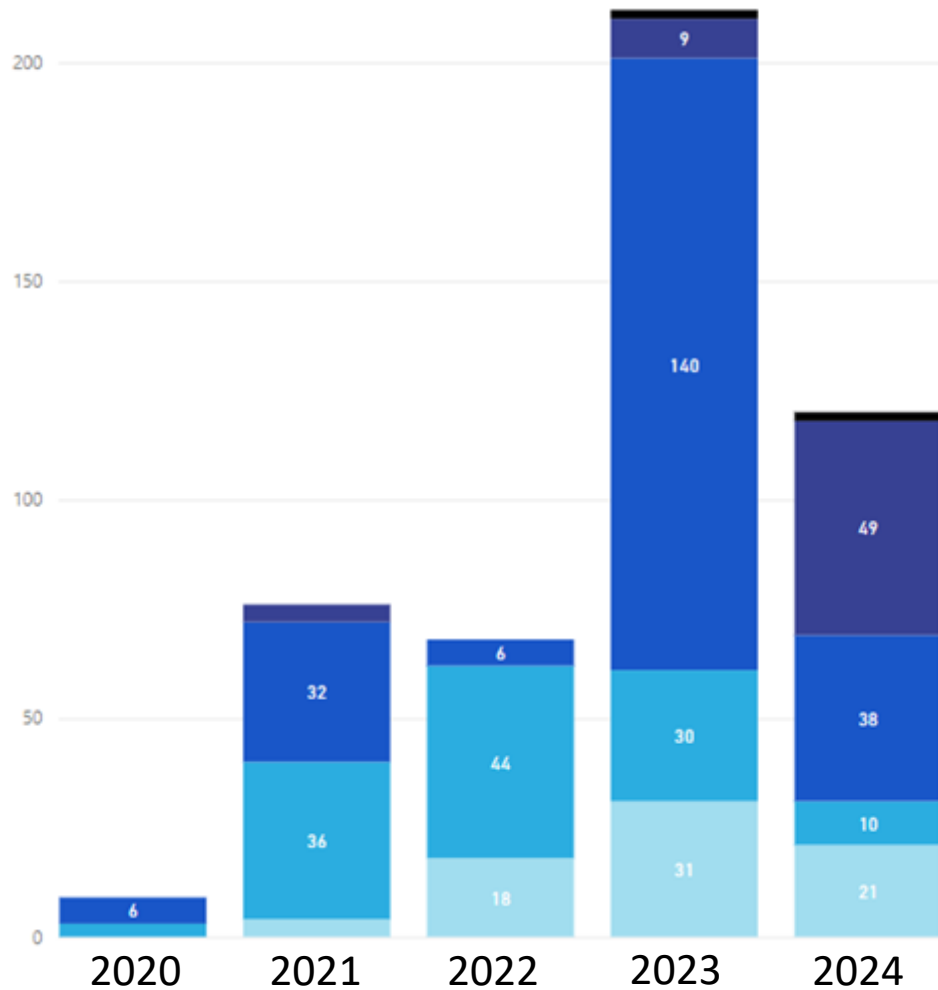
Farmer testimonial - EBENE



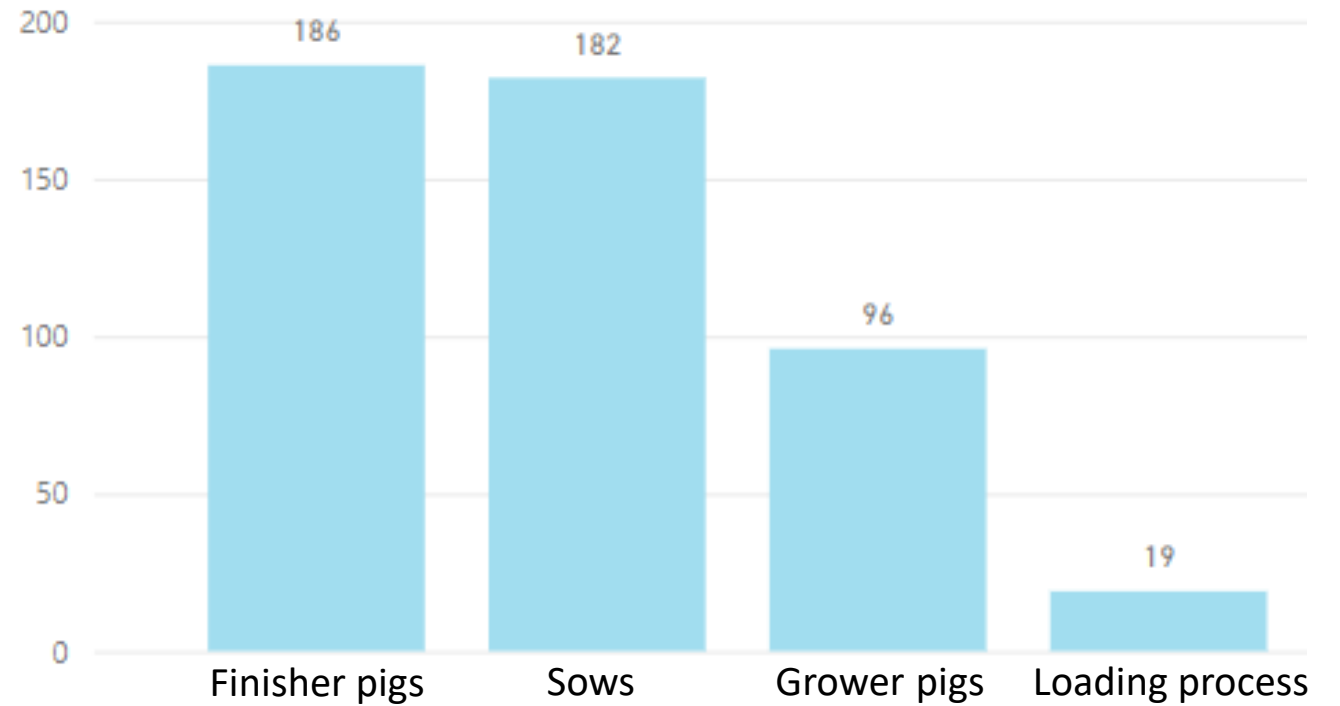
PIGLOW – User statistics (September 2020 – May 2024)

Total questionnaire responses by period and account profile

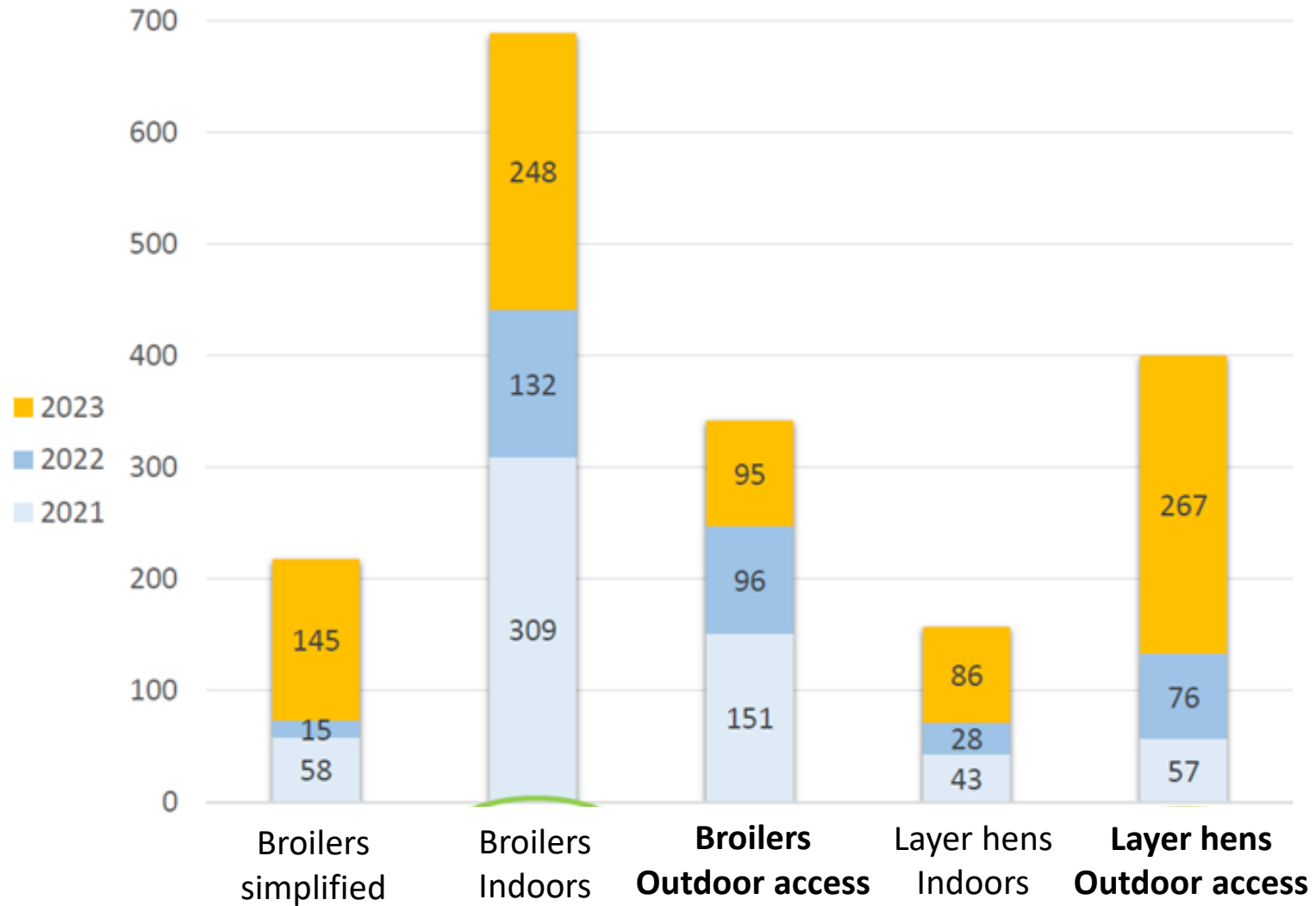
Account profile ● Consultant ● Farmer ● Scientist ● Student ● testgebruikers



Total questionnaire responses by animal category



EBENE – User statistics (2021-2023)





Longitudinal study

Longitudinal study



Period = **2 years**

Assessments by researcher + farmer = **1st and last**

Assessments by farmer = **3/year**

Filling out survey = **beginning and end**



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Assessments by farmer = **2/year**

Filling out survey = **beginning and end**

Research questions:

- How do welfare assessments with the PIGLOW and EBENE app by farmers compare to those by trained researchers?
- Do frequent animal welfare self-assessments with the PIGLOW and EBENE app lead to an improvement of animal welfare on the farm?
- What do farmers think of the apps?

Longitudinal study



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- **Do frequent animal welfare self-assessments with the PIGLOW and EBENE app lead to an improvement of animal welfare on the farm?**
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The apps in action...



Effect on animal welfare – Analysis PIGLOW

Detailed welfare assessment:

- Individual welfare indicators with score between 0 (best) and 100 (worst)
 - Group welfare indicators with scores between 0 (best) and 3 (worst)
 - “Scratches”: the average number of scratches per side of the body
 - “Enrichment use”: percentage of pigs
-
- N = 11
 - 16-59 finisher pigs and 1-27 groups per assessment

Comparison per welfare indicator (19) of:

- Median at the beginning vs end of the study
- Number of farms with improved vs worsened scores

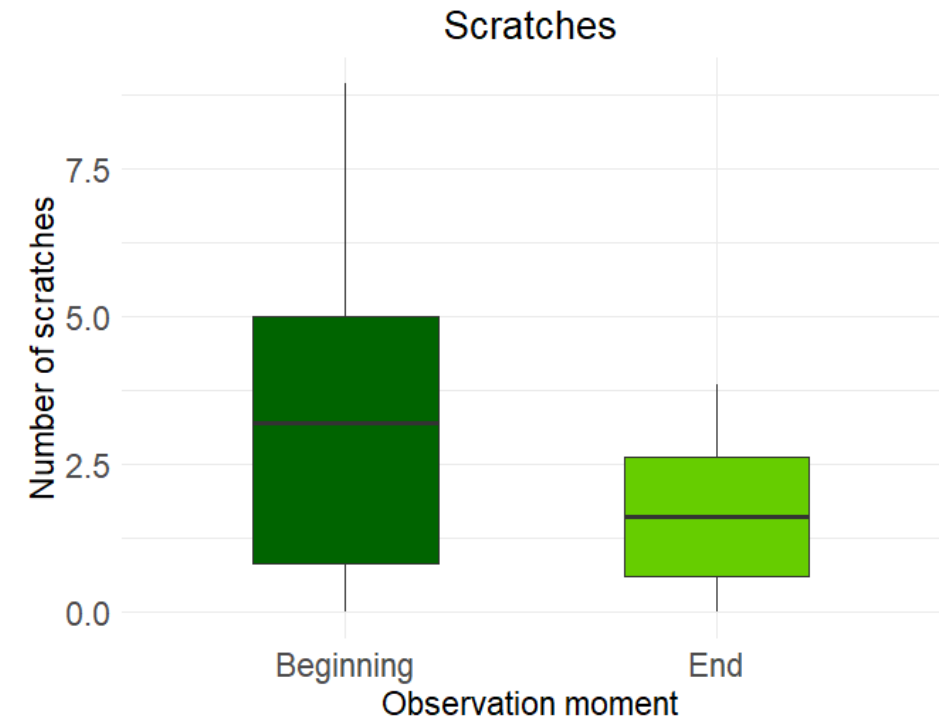
Effect on animal welfare – Results PIGLOW

Welfare indicator	Median beginning	Median end	Farms with improved scores	Farms with worsened scores
Panting	0	0	1	1
Shivering	0	0	0	0
Too small	1.67	3.08	5	4
Bad general state	0	0	3	1
Hernia	0	0.41	3	4
Laboured Breathing	0	0	3	3
Covered with faeces	4.40	2.01	6	4
Skin wounds	0.23	0.21	8	3
Scratches	3.20	1.60	8	2
Ear lesions	0.31	0.13	7	4
Tail lesions	0.07	0	7	2
Skin irritation	0	0	3	4
Lameness	1.63	0	8	3
Huddling	0	0	4	4
Enrichment use	20.15	19.18	5	7
Fear of humans	0.21	0.40	1	6
Liquid faeces	0	0	4	3
Coughing	0.23	0.20	5	5
Sneezing	0	0	4	2

n=11

Effect on animal welfare – Results PIGLOW

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n=11

Effect on animal welfare – Analysis EBENE

Detailed welfare assessment

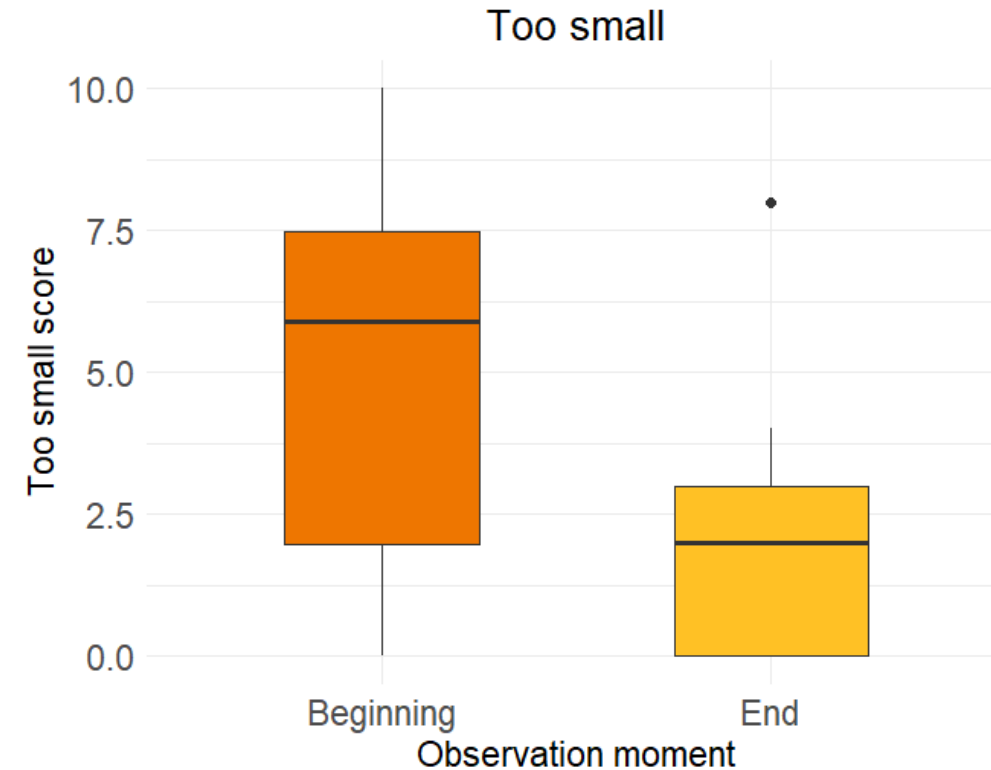
- “Still”, “Too small” and “Other anomalies”: percentage of chickens scores as “yes”
- Other individual welfare indicators: score between 0 (best) and 100 (worst)
- Group behaviours: frequency of the behaviour per chicken per 5-minute observation
- “Enrichment use” and “panting”: percentage of chickens
- N=7 for individual indicators, N=9 for group indicators
- 19-50 chickens and 3-5 groups

Comparison per welfare indicator (18) of:

- Median at the beginning vs end of the study
- Number of farms with improved vs worsened scores

Effect on animal welfare – Results EBENE

Welfare indicator	Median beginning	Median end	Farms with improved scores	Farms with worsened scores
Still	0	0	1	1
Too small	5.88	2	4	1
Dirtiness	0	0	3	0
Wounds	0.88	0	5	0
Footpad dermatitis	23.42	36.20	3	4
Hock burn	4.14	11.90	2	5
Lameness	0	2.40	0	5
Other anomalies	0	0	2	1
Dust bathing	0	0	3	1
Preening	0.22	0.24	5	4
Foraging	0.38	0.54	5	4
Stretching/wing flapping	0.26	0.49	7	2
Aggressive pecking	0.01	0.01	6	3
Positive interaction	0.05	0.04	4	5
Enrichment use	0	2.44	5	1
Panting	0	0	7	2
Resting	4.06	3.00	2	7
Distance from humans	2.25	3.00	1	4



n=9

Effect on animal welfare – Results EBENE

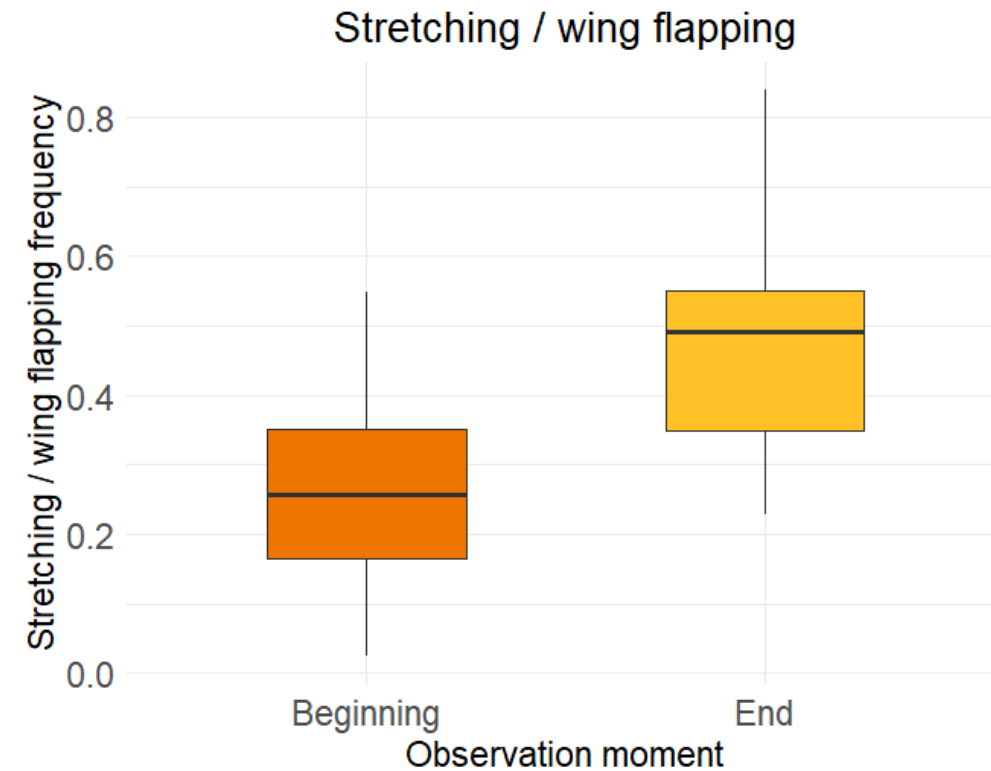
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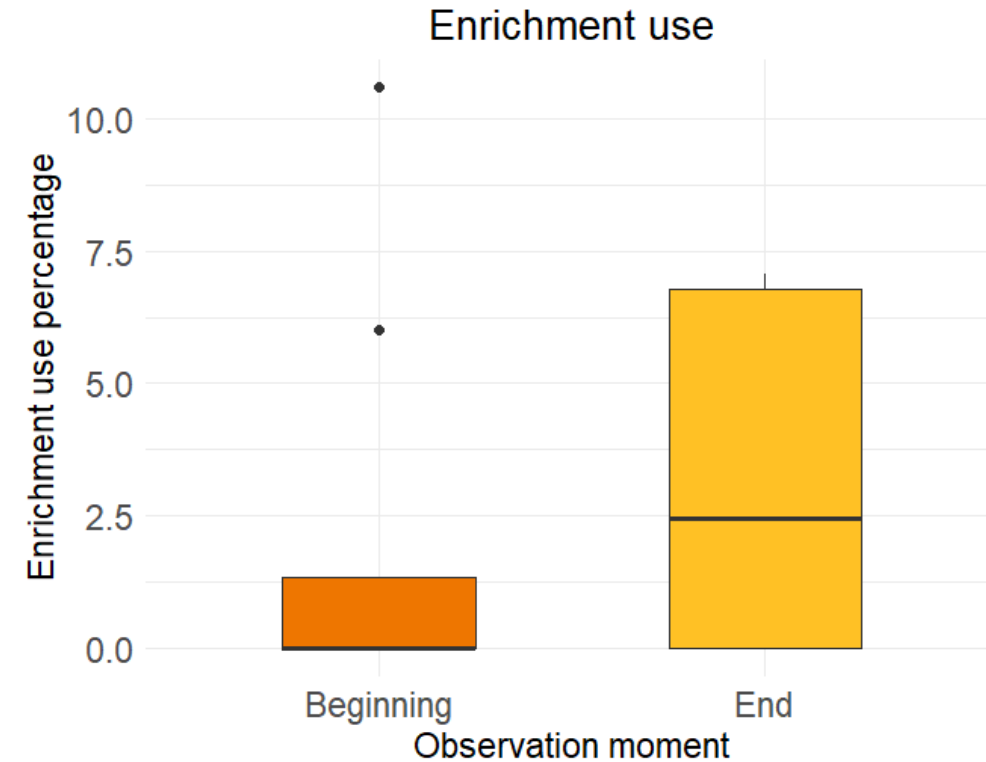
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n=9

Effect on animal welfare – Conclusion

- No overall effect of the use of the PIGLOW or EBENE app on animal welfare
- Is more frequent use necessary? Is feedback/benchmarking not helpful enough?
- Welfare on the participating farms was already quite good

But...

- PIGLOW: possible effect on scratches and lameness
- EBENE: possible effect on small chickens, wounds, stretching/ wing flapping, and enrichment use
- Is this related to the use of the apps?
- Comments from farmers: more attention to scratches (pigs), enthusiastic about behaviour (poultry)



Opinions of farmers on the PIGLOW and EBENE app

Farmers' opinion on the app – Results PIGLOW

Overall, do you feel like the use of the PIGLOW app has changed how important certain aspects of animal welfare are to you? Rate on scale from 1 (not at all) to 7 (very much).

Mean score: 4,00

SD: 2,00

Comments:

“The assessment of lesions, scratches, etc. on the bodies of pigs has evolved positively in my opinion. I pay more attention to it.” (5)

“If you assess the pigs with the app, you do look more closely” (6)

“Because we muck out the enclosures every day, we have a good image of the welfare of the animals. I don't think we treat the animals differently.” (4)

“Our whole farm already revolves around obtaining the best possible animal welfare, it's our main goal.” (1)

n=11

33

Farmers' opinion on the app – Results PIGLOW

Overall, do you think the use of the PIGLOW app has led to an improvement of the welfare of your animals? Rate on a scale from 1 (not at all) to 7 (absolutely).

Mean score: 3,82

SD: 1,60

Comments:

“More reflection on pig behaviour” (5)

“It has made me look at the animals slightly differently, but we were already very focused on it” (2)

“We regularly have young people walking around here, and I find that the app has added value for them. Now they know what they should look at.” (4)

n=11

34

Farmers' opinion on the app – Results PIGLOW

How would you rate the PIGLOW app on a scale from 1 tot 10?

Mean score: 8,09

SD: 1,37

Comments:

“I found the app very easy and userfriendly. I think it is very suitable for a farmer who wants to improve welfare”
(9)

“I think this app has added value for new comers in the sector. They can learn how to look at an animal, what you should pay attention to, and how to see whether an animal feels comfortable” (5)

n=11

35

Farmers' opinion on the app – Results PIGLOW

Would you recommend the PIGLOW app to other farmers?

8: yes

3: yes, if some changes are made

What changes would you like to see made to the PIGLOW app?

“None, it’s very good like this” (9)

“I would maybe give some more practical tips in the apps, or examples from real farms” (9)

“More depth and better feedback on the results” (7)

“Sometimes a little bit too precise” (9)

n=11

36

Farmers' opinion on the app – Results EBENE

Overall, do you feel like the use of the EBENE app has changed how important certain aspects of animal welfare are to you? Rate on scale from 1 (not at all) to 7 (very much).

Mean score: 5,11 out of 7

SD: 0,78

Comments:

“The app makes us observe the animals for a longer time in the zones. Because of that we can see their behaviour more easily and judge their welfare.” (5)

“Analysis of exploration” (6) “Allows you to quantify animal behaviour” (5) “General behaviour” (4)

“I was already sensitive to animal welfare before use, the fact of applying it nevertheless encouraged me to be more concerned about it” (5)

n=9

37

Farmers' opinion on the app – Results EBENE

Overall, do you think the use of the EBENE app has led to an improvement of the welfare of your animals? Rate on a scale from 1 (not at all) to 7 (absolutely).

Mean score: 4,22 out of 7

SD: 0,97

Comments:

“Observation confirmed to me that the greater the density, the less animal well-being there is.” (4)

n=9

38

Farmers' opinion on the app – Results EBENE

How would you rate the EBENE app on a scale from 1 tot 10?

Mean score: 7,78

SD: 0.97

Comments:

“The application is intuitive” (6)

“Difficult to understand the results. Solutions to problems are not targeted” (7)

n=11

39

Farmers' opinion on the app – Results EBENE

Would you recommend the EBENE app to other farmers?

8: yes

1: yes, if some changes are made

What changes would you like to see made to the EBENE app?

“More photos for explanations” (6)

“Being able to go back. It's not always possible to go back and so sometimes you have to start all over again.” (9)

“Recording of breeding parameters once encoded for the first time. Very restrictive to have to provide building information each time (number of pipettes, size of plates, etc.” (7)

n=11

40

Farmers' opinion on the app – Conclusion

- Opinions differed, but overall, the use of the PIGLOW app had a medium sized effect on how pig farmers look at animal welfare and on their performance on their own farm
- Farmers rated the PIGLOW app very highly, but partially because they saw the potential for others
- Farmers saw a medium to large effect of the EBENE app on how they valued welfare aspects and a medium sized effect on their performance on their own farm
- The EBENE app was rated quite highly, but some technical issues were pointed out
- Comments showed that farmers each have different wishes

To improve the impact of the app we could:

- Add more practical tips as part of the feedback
- Target newcomers in the sector or farmers who are not focused on animal welfare yet

Thank you to the partners involved:

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Mona Giersberg (UU)
Stella Nauta (UU)
Marion Pertusa (ITAVI)
Mathilde Stomp (ITAVI)
Valérie Courbouley (IFIP)
Marie-Christine Salaün (INRAE)
Hélène Leruste (JUNIA)
Vanessa Guesdon (JUNIA)
Bérengère Billiard (JUNIA)
Laura Van Vooren (Bioforum)
Sophie Herremans (CRA-W)
Virginie Decruyenaere (CRA-W)
Lise Boulet (CRA-W)
Anne Collin (INRAE)



Thank you for your attention

Contact: evelien.graat@ilvo.vlaanderen.be

www.ppiLOW.eu