

Weighing system for fattening pigs and piglets PigScale



Background information

Project vital pigs

Within the project 'Project vital pigs' research is conducted to the accuracy and practicality of Weighing systems for fattening pigs. In practice there is great need for the automatic weight collection of pigs during the fattening process, so that the growth of the pigs can be monitored and, if necessary, can be adjusted.

Network Cockpit

Network Cockpit is a practical network and consists of 5 pig farmers who have thought long and hard about future development in weighing systems. They are looking for management tools, which they can use to adjust the growth and the feed intake of the fattening pigs while they are growing. Weighing of the pigs can make an important contribution.

Goal of the research of weighing system PigScale

- Determining the accuracy of the weighing system PigScale
- Gaining of user experiences for the sector about the automatic weighing systems

Explanation of the weighing system PigScale

PigScale is an automatic weighing system that does not require modifications to the building. The PigScale is developed by H&F Electronics. The pigs are entering the weighing system on a voluntary basis, where they will be weighted automatically. There are currently two versions: A PigScale for piglets and a PigScale for fattening pigs.



Picture 1: Impression of PigScale

Hardware

- The PigScale is a cage construction of stainless steel (see picture 1)
- The PigScale is moveable within the building
- A weighing computer that registers the weights of the pigs is mounted on the construction

Software

- The PC software enables the user to analyse the weigh data from the weighing computer. The graphs and tables provide you the insight into the growth of your pigs
- The following data can be viewed in the software program at any time of the day :

Average weight parameters:

- Average weight of the last #50 weightings
- Current average weight
- Standard weight; current average weight according to the present standard curve

- Deviation current average weight compared to the standard weight

Growth parameters:

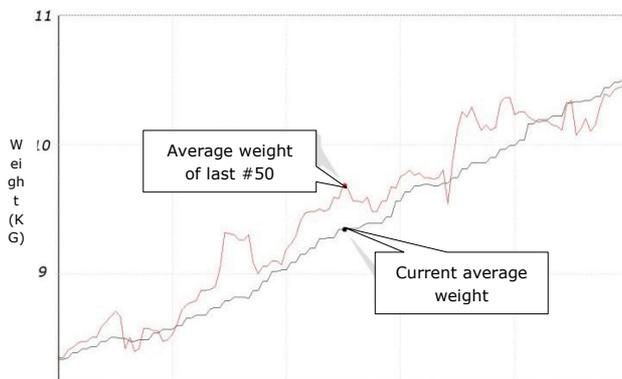
- Growth yesterday
- Growth trend of the last 24 hours

Weigh parameters :

- Number of weightings that day, gives access to the activity in the pen
- Number of weightings yesterday
- Highest weight today, gives the weight of the heaviest weighted pig of today
- Lowest weight today, gives the weight of the lightest weighted pig of today

Statistical parameters:

- Standard deviation; indicates the size of the average spread of weighted pigs compared to the current average weight, expressed in grams
- Coefficient of variation; gives the spread compared to the current average weight expressed as a percentage
- Uniformity; indicates the percentage of the weighted pigs, within a range of +/- 10% of the current average
- It is possible to view these parameters separately or together in a graph
- The software program gives the average weight of your pigs as a " average weight of last # 50 weightings" (line 1) and "current average weight "(line 2).
 - Line 1: "average weight of last #50 weightings" gives a quick indication of the activities in the pen. This line will follow faster a negative or positive growth trend, given that the average weight is based on the last 50 weightings
 - Line 2: "current average weight" based on all accepted weightings from supporting the average weight. It gives a reliable picture of the average weight of your pigs. However, a positive or negative growth trend will take longer to be followed.



Picture 2: Graph with line 1: 'average weight of last #50 weightings; Line 2: 'current average weight'

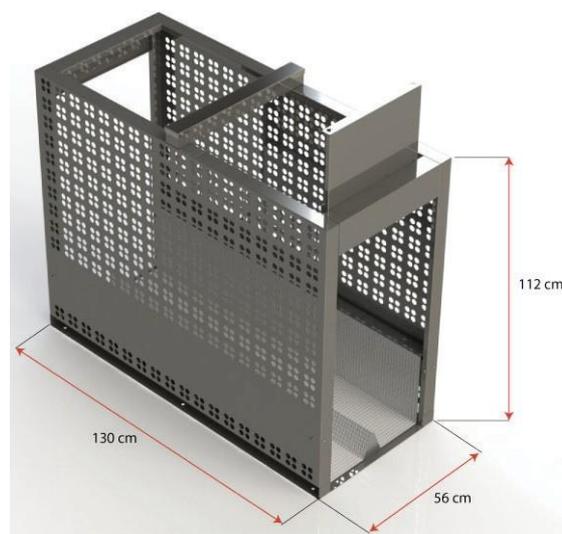
User manual:

- At each new batch, a new batch should be started in the software program . It should be indicated how many pigs are present in the pen and what the ages of the pigs are
- The acquisition of the PigScale, gives you an insight into the growth of your pigs.
- By working consciously with the measured data and by gaining experience with the PigScale, you can interpret the weigh data correctly and adjust your management where necessary.

Communication opportunities

- Direct cable connection to the PC (local access to your weighing data).
- Internet, broadband connection or GPRS (global access to your weighing data).

Dimensions:



Picture 3: Dimensions PigScale

- Specification PigScale for fattening pigs: l x w x h : 130 cm x 56 cm x 112 cm; Weight 60 kilograms
- Specification PigScale for piglets: l x w x h : 95 cm x 35 cm x 63 cm; Weight 34 kilograms

Results hanging VS PigScale

Accuracy PigScale for fattening pigs:

- 12 pigs in 1 pen were followed in 2 batches in the finishers. This way the accuracy of the PigScale for finishing pigs was determined.
- The accuracy is determined by hanging the comparing hanging scales and that of the Pig Scale. The maximum deviation between this two weights must not exceed 3%. This target has been fixed previously based on literature and practical experience.

	Round 1		Round 2	
	Deviation in KG	Deviation in %	Deviation in KG	Deviation in %
Line 1	1.5 kg	-2.4%	-0.6 kg	0.9%
Line 2	0.9 kg	-1.7%	-0.1 kg	0.5%

Table 1: Average deviation in a batch of finishers between the PigScale and hanging (in percentage and kilograms) line 1: 'average weight of last #50 weightings; Line 2: 'current average weight'

- The PigScale meets the target of maximum 3% deviation

Accuracy PigScale for piglets:

- 12 pigs in 1 pen were followed in 2 batches in the finishers. This way the accuracy of the PigScale for finishing pigs was determined.
- The accuracy is determined by hanging the comparing hanging scales and that of the Pig Scale. The maximum deviation between this two weights must not exceed 5%. This target has been fixed previously based on literature and practical experience.

	Round 1		Round 2	
	Deviation in KG	Deviation in %	Deviation in KG	Deviation in %
Line 1	-0.1 kg	0.5%	-0.3 kg	2.1%
Line 2	-0.1 kg	0.9%	-0.4 kg	1.8%

Table 2: Average deviation in a batch of weaners between the PigScale and hanging (in percentage and kilograms) line 1: 'average weight of last #50 weightings; Line 2: 'current average weight'

- Based on literature and experiences, a target of 5% deviation is acceptable for weaners up to 25Kg
- The PigScale meets the target value of a maximum 5% deviation

User experience

Maintenance

- A proper cleaning of the scale prevents false weightings. The advice is to clean the scale after each batch, using high pressure
- Advice is to calibrate the scale once a year

Selecting

- The sorting of pigs is possible by making use of the integrated marking unit. The software allows you to set a marker weight. The spray marker will be activated at a corresponding weighting, based on this marker weight
- The pigs enter the weighing system on voluntary basis. It may happen that not every pig is marked that meets the weight criteria
- By using the PigScale as a walk-through scale (corridor scale), you can be sure that every pig is marked that meets the weight criteria

Continuous data

- You will get continuous data about the current weight parameters of the pigs.
- It is possible to search back on time and date and view the history of the associated weighing data

Activity

- The number of weightings per day gives a view of the activity in the pen.

Service life

- The PigScale is made of stainless steel
- The load cells are IP68 (dustproof & waterproof)
- Service life is unknown, but through the use of sustainable materials the Pigscale has a service life of at least 10 years
- The manufacturer offers a 2 year warranty on the scales, except by damage from lightning, overloading or improper use



Figure 4: Impression fattening pigs



Picture 5: Impression connecting PigScale

Colophon

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