

Real Welfare for Red Tractor 2013 **Measures for on-farm assessment (finishers)**

These sampling protocols are for the standardized measures to allow accurate comparison between units for Real Welfare measures for Red Tractor compliance. The total number of pigs to be sampled is the same across the year, it is the decision of the vet and farmer whether this is split into three or four visits. For batch finishers finishing less than three batches per year, calculate the total pigs to assess as though three visits will be carried out and complete assessments on the number of batches available.

The sampling protocols have been developed and trialled on farm – whilst different housing types and group problems pose their own data collection challenges, these have been taken into consideration to propose a system that is fair to all pen types.

Please note the difference between finisher places and finisher pigs. “Finisher places” refers to the building set up and physical places on the unit which will (at some point) house pigs >50kg; “finisher pigs” refers to pigs >50kg present on the day. Sampling numbers are based on finisher places, which is assumed to remain fairly constant with the exception of building construction or demolition; finisher pigs on the day may well vary due to pig flow, movements to slaughter etc. Sampling is based on number of finisher places in order to provide a consistent representative sample of pigs on the unit.

Where number of finisher places on the farm varies considerably from one visit to the next, this may delay bureau data entry as a query will be raised to double check farm set up against previous information.

Pigs per year – new flexibility

- Where a unit has up to 300 finisher places, sample a minimum of 300 finishers across the year (*minimum 100 pigs per sample*).
- Where a unit has 900 or more finisher places, sample a maximum of 900 finishers across the year (*split between 3 or 4 visits = 300 or 225 pigs per sample*)
- Where a unit has between 300 and 900 finisher places, sample a third of finishers per visit if using 3 visits, or a quarter of finisher places per visit if using 4 visits. (*e.g. on a 600 place finisher unit, sample 200 pigs on each of 3 visits, or 150 pigs on each of 4 visits; total 600 across the year; on an 800 finisher place unit, sample 266 pigs on each of 3 visits, sample 200 pigs on each of 4 visits*).

Sampling protocol (pigs per pen)

1. Approximately **225 finishing pigs** are required (**>50kg**) when conducting 4 assessments per year (or 300 if conducting 4 visits) **on a unit with 900+ finisher places**

The aim is to get a representative sample from across the unit, e.g. if half the pigs are in one housing type, half the sample will come from that housing type; if the pigs are split with a quarter in one housing type and three-quarters in a different type, ¼ of the sample

should be from one sort, and $\frac{3}{4}$ from the other sort. Find out the distribution of pigs and pen types on the unit before starting to sample (this can be entered and stored on the app).

2. Decide which pens will be sampled from before you enter the building (e.g. 2nd on the left then 3rd on the right, then 5th etc.)
 3. Where there are 25 pigs or fewer in a pen then **all** the pigs in the pen should be sampled, where there are 25-100 pigs, sample **25** pigs; where there are more than 100 pigs per pen, sample **50** per pen.
 4. If you have a few very large pens and sampling 50 from each pen will not get to a total of 225 pigs, split the 225 between all pens, or between at least 5 pens.
 5. When sampling pens of more than 25, make observations on every 2nd, 3rd or 4th pig per quarter of the pen (depending on target number of sample pigs needed) – make sure pigs are observed from all quarters of the pen
- For hospital pigs and lameness look at all pigs within the pen (these are often at low prevalence, so the larger sample size is more accurate, it is also hard to be unbiased about including or ignoring these animals when looking in the pen).
 - For body marks and tail lesions score 25 pigs (or other sample size from sampling protocol). These do not have to be the same pigs for each measure.
 - For enrichment use, just look at sitting or standing pigs within the pen.

In practice, this requires an initial walk through to ensure all pigs are seen walking, and where lame pigs and pigs in need of hospital pen treatment can be counted. A second walk through assesses the sample number of pig tails for lesions, followed by the sample number of pig sides for body marks (only one side of the pig is assessed for body marks). Enrichment use can then be scored from outside the pen.

1. Sampling at building level

The aim is to sample a representative proportion of pigs according to the building size, e.g. if there are 2 buildings, with the same number of pigs in each, half the total sample should come from each building; if one building houses twice as many pigs as the other, twice as many pigs should be sampled from that building.

E.g.1) On a farm with 900 pigs, building A houses 300 pigs ($300/900 = 1/3$ of pigs), building B houses 600 pigs ($600/900 = 2/3$ of pigs), if 300 pigs are being sampled, then 1/3 should come from building A (= 100), and 2/3 should come from building B (= 600).

E.g.2) On a farm with 1200 pigs, building A houses 400 pigs, building B houses 200 pigs, building C houses 600 pigs. Building A therefore gets $400/1200 = 1/3$ of sample number ($1/3 \times 300 = 100$; $1/3 \times 225 = 75$); Building B gets $200/1200 = 1/6$ of sample number ($1/6 \times 300 = 50$; $1/6 \times 225 = 37.5$); building C gets $600/1200 = 1/2$ of sample number ($1/2 \times 300 = 150$, $1/2 \times 225 = 112.5$).

2. Number of pens to sample

Number in **RED** is the total sample needed for that visit, **225** is given as an example on a unit with >900 pigs, and **300** is given as an example if the same farm had 3 visits per year; *but this will change according to farm size and number of visits over the year.*

- Where you have 10 finishers per pen, all pigs will be looked at for all measures, so need to look at $225/10 = 22$ or 23 pens to get sample of **225** ($300/10 = 30$ pens to get sample of 300)
- Where you have 25 finishers per pen, all pigs will be looked at for all measures, so need to look at $225/25 = 9$ pens to get sample of **225** ($300/25 = 12$ pens to get sample of 300)
- Where you have 50 finishers per pen, only 25 pigs per pen will be looked at for lesion scores, $225/25 = 9$ pens to get sample of **225** (450 pigs will be assessed for lameness and hospital categories). ($300/25 = 12$ pens to get sample of 300, 600 pigs will be assessed for lameness and hospital categories)

*If there are less than 9 pens on the unit, more pigs will need to be lesion scored per pen – e.g. if there are 8 pens of 50, 28 pigs will need to be looked at for lesion scores to get to the total **225**. If there are 8 pens of 50, 37 or 38 pigs per pen will need to be assessed to get to the total 300*

- Where you have 150 finishers per pen, only 50 pigs will be looked at for lesion scores, $225/50 = 4.5$ (i.e. 5) pens to get sample of **225** (750 pigs will be assessed for lameness and hospital categories). $300/50 = 6$ pens to get sample of 300 pigs, 900 pigs will be assessed for lameness and hospital categories)
*If there are less than 4 pens on the unit, more pigs will need to be lesion scored per pen – e.g. if there are 4 pens of 150, 56 pigs will need to be looked at per pen for lesion scores to get to the total **225**. (If there are 4 pens of 150, 75 pigs will need to be looked at per pen for lesion scores to get to the total 300)*
- Ideally assess a minimum of 5 sample pens to achieve the total 225 finishers. (6 pens for 300.)

2) Sampling – building and pen examples

Farm A has 2 types of building, Building 1 has 20 pens of 20 pigs (400 pigs), Building 2 has 30 pens of 15 pigs (450 pigs), farm total 850 pigs

Sample from Building 1 needs to be $400/850 \times 225 = 106$ pigs. Pens hold less than 25 pigs so all 20 pigs per pen need to be observed in $(106/20)$ 5 to 6 pens (100 - 120 pigs)
Sample from building 2 needs to be $450/850 \times 225 = 120$ pigs. Pens hold 15 pigs so all 15 pigs need to be observed in $(120/15)$ 8 pens (120 pigs)
(Looking at the buildings, one has 400, one has 450 so we can see that roughly half the sample of 225 pigs need to come from each building, with slightly more from building 2 than building 1)

Farm B has 2 types of building, Building 1 has 10 pens of 25 pigs (250 pigs), Building 2 has 4 pens of 50 pigs (200 pigs), Building 3 has 20 pens of 40 pigs (800 pigs); farm total 1250 pigs.

Sample from building 1 needs to be $250/1250 \times 225 = 45$ pigs. Pens hold 25 pigs so all 25 pigs per pen need to be observed in $45/25 = 2$ pens.
Sample from building 2 needs to be $200/1250 \times 225 = 36$ pigs. Pens hold 50, so sample 25 pigs from the pens, $(36/25)$ 1-2 pens.
Sample from Building 3 needs to be $800/1250 \times 225 = 144$ pigs. Pens hold 40, so sample 25 pigs from the pens, $(144/25) = 6$ pens (sample 25 from each of 6 pens)
(Looking at the buildings, buildings 1 and 2 have similar numbers of pigs; building 3 has more than half the pigs on the unit, 3 times as many pigs as building 2; so Building 3 should have more than half the sample size $(144/225)$, the remaining ~90 pigs will be split fairly evenly between buildings 1 and 2 (45 and 36))

Farm C has 4 types of building. Building 1 has 4 pens of 250 (1000), building 2 has 16 pens of 50 (800), building 3 has 32 pens of 18 (576) and buildings 4, 5 and 6 have 40 pens of 15 (600 per building, 1800 pigs), Farm total ~4176 pigs

Sample from building 1 = $1000/4176 \times 225 = 54$ pigs. Ideally sample from more than one pen; $54/2$ pens = Sample 27 pigs from 2 pens (or 54 from one pen).
Sample from building 2 = $800/4176 \times 225 = 43$ pigs; sample 25 pigs from the pens of 50, $43/25 =$ sample from 2 pens
Sample from building 3 = $576/4176 \times 225 = 31$ pigs. Pens are less than 25 so sample all pigs; $31/18 = 1.7$ sample from 2 pens.
Samples from buildings 4, 5, 6 = $1800/4176 \times 225 = 97$ pigs total; split between 2 or 3 buildings = 48 or 32 per building. (Sample from 2 buildings if all buildings are very similar).
Sample all pigs in $48/15 =$ sample 3 pens from 2 buildings (18 pigs x 3 pens x 2 buildings = 108 pigs), or $32/15 = 2$ pens in all 3 buildings (18 pigs x 2 pens x 3 buildings = 108 pigs).
Roughly a quarter of pigs are housed in building 1, so roughly a quarter of the sampled 225 should be building 1; building 2 should be less than this, and building 3 just over half of building 1. Buildings 4, 5 and 6 should be approaching twice the amount of pigs sampled in building 1, but divided between the buildings.

Farm D has 2 types of buildings; Building 1 has 2 pens of 100 finishers (200 pigs), Building 2 has 6 pens of 50 pigs (300 pigs), total 500 pigs.

Sample from building 1 needs to be $200/500 \times 225 = 90$ pigs; Pens hold 100, but there are only 2 pens, so split the 90 between the 2 pens and look at $90/2 = 45$ pigs in 2 pens
Sample from Building 2 needs to be $300/500 \times 225 = 135$ pigs; Pens hold 50 but there are only 6 pens; look at either 45 pigs in 3 pens, or 34 pigs in 4.

General rules for calculating pig numbers:

- Step 1** – Find or calculate the number of finisher pigs on unit (farm records; ask farmer etc.).
- Step 2** – Find the number of pen or building types i.e. differing by group size or housing type.
- Step 3** – Calculate percentage of pigs in each housing/building type i.e. number per type / total number finishers.
- Step 4** – Calculate percentage of sample needed per pen type i.e. percentage per type x total sample for this visit (finishers).
- Step 5** – Calculate the number of pens required to meet the sample size – bearing in mind different numbers to sample from each pen size.
- Step 6** – *Check that total number of pens x animals is approximately the total sample required for this visit finishers.*

Summary – sampling (900+ finisher unit, 4 visits)

- Sample 225 finishers (>50kg)
- Split sample to represent buildings on the unit
- Assess 225 finishers for tail lesions and body marks
- Assess all other pigs in those pens for hospital pigs and lameness
- Assess all sitting or standing pigs for enrichment use

Pen size	Number to sample
0-25 pigs	All
25-100 pigs	25 pigs
>100 pigs	50 pigs*
	* if total of 225 finishers will not be reached because farm has just a few very large pens, split the sample between the pens available