



Videncenter for
Svineproduktion

Guidance in Nucleus Management

Valid from 1 January 2012

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EXEMPTION CLAUSE

The Pig Research Centre intends with these guideline to give pig producers access to be able to implement an optimum recruitment of their breeding stock.

It is aspired that the information in these guidelines are updated and correct. Any errors are sought to be corrected.

Unless specifically agreed otherwise, the Pig Research Centre assumes no responsibility for the accuracy of the information in this guidance and in the Pig Breeding Database, since this information is solely for informational purposes and does not seek to resolve individual queries or specific need for guidance. Thus the Pig Research Centre cannot be held liable for losses incurred as a result of arrangements that are made on the basis of information from this system. If ever you should require any factual advice on specific areas, please contact your consultant for Nucleus Management.

Guidance in Nucleus Management

1 Background

- 1.1 Herds with On-Farm Replacement Production can extend this concept with Nucleus Management.
- 1.2 Guidance in Nucleus Management provides guidelines for breeding work in commercial herds which have entered into an agreement with Breeding & Genetics, Pig Research Centre (= PRC) to be registered as a Nucleus Management herd.
- 1.3 Guidance in Nucleus Management is based on that data is reported electronically.

2 Modification of Guidance in Nucleus Management

- 2.1 Guidance in Nucleus Management has been elaborated by Breeding & Genetics and is subject to on-going changes by Breeding & Genetics.
- 2.2 The pig producer or his consultant in Nucleus Management must be notified as soon as possibly by letter and/or e-mail if any modification of Guidance in Nucleus Management in accordance with 2.1 has been made.

3 Advisory service

- 3.1 Advisory service of herds undertaking Nucleus Management is carried out by the advisor affiliated to the herd.

4 Information on herd and animals

- 4.1 General

The Nucleus Management program is offered to commercial herds with one of the following replacements strategies:

Nucleus herds, including boar nucleus - However, the use of AI boars is recommended.

Intro-regression

Zigzag herd

Any female of known breed can be registered in the Pig Breeding Database and have

its index calculated provided it is within the approved recruiting strategies.

Non-approved animals from breeding and multiplication herds can be registered in Nucleus Management.

The index is calculated as a pedigree index without taking into account registrations at animal level in the herds (e.g. litter size). On these grounds reporting of the sows' previous reproduction data is not necessary, when registration with the Nucleus Management Program is carried out.

Herds, which have used breeding material from any other breeding system than Dan-AvI may also participate in Nucleus Management, however, these animals will be assigned an approximated index due to the origin of their parents being unknown.

Gilts can only be accepted at an age interval from 120-500 days after the date of birth; i.e. the entry date must be in the range of 120-500 days after the date of birth.

Mating in Nucleus Management must be carried out with the same boar - thus combination matings become meaningless. Within 10 days after the first mating a re-mating must be carried out with the same boar in order to obtain approval.

Farrowing can be approved, only, if it is in the range of 109-125 days after mating.

LY/YL-gilts can be registered as nucleus animals in purebred nucleus herds.

Use of several different breeding strategies on the female line within the same herd, such as purebred Landrace nucleus and zigzag strategy requires allocation of a herd number per breeding strategy, and therefore payment for two herd numbers, cf. 9.1.

Use of one breeding strategy at the female line in conjunction with the production of boars in a boar nucleus, e.g. zigzag strategy at the female line and a Duroc boar nucleus at the male line, does not require two different herd numbers.

Breeding & Genetics shall be informed of by what means reporting will be conducted, that is to say, what kind of electronic E-control program will be used.

A modification of the herd status in relation to the internal breeding strategy (e.g. switching from nucleus herd to zigzag strategy) is conducted by the consultant affiliated to the herd contacting Breeding & Genetics for a further agreement.

Exchanging a consultant can only be done at the owner's written request to Breeding & Genetics.

4.2 Registration of purchased animals

Nucleus:

Purebred animals are registered via an entry record, where the animal's ID number (cf. delivery note) and assigned name (cf. 6) shall be recorded together with date of entry in the herd. Purchased hybrid boars are registered.

Subsequently, on-going reporting takes place as described in 7.1.

Zigzag:

LY/YL's are registered by an entry record, where the animal's identification number, the entry date and the name (cf. 6) are stated, cf. the information from the delivery note.

Subsequently, on-going reporting takes place as described in 7.2.

4.3 Registration of on-farm produced females with known breed and known origin; e.g. offspring/gilts of purchased animals.

These animals are registered either by an entry record or by a farrowing record for the mother; i.e. tracing one generation further back than the animals, which are of interest. The latter approach is as follows:

Register the mother of the animal in question, cf. 4.2.

Report mating for the litter, which includes animals of interest.

Report farrowing with ID numbers for the litter, of which animals of interest are included, on a farrowing record.

Thereafter it is reported continuously as described in 7.1 (nucleus) and 7.2 (zigzag).

4.4 Registration of on-farm produced females of known breed and partly unknown origin

These animals are registered either by an entry record or by farrowing record for the mother; i.e. tracing one generation further back than the animals, which are of interest. The latter approach is as follows:

Register the mother of the particular animal on an entry record on which the animal's ID, entry date, name, date of birth and parents' ID numbers are stated, possibly in form of the ID codes for animals with known breed and unknown origin, cf. appendix 1. The ID number of the mother is created on the basis of the assigned herd number, name of the sow and her year of birth. Alternatively, in the establishing phase, the use of 4-digit numbers between 9000-9999 can be chosen as the consecutive digits in place 4-7 of the ID number of the mother. See appendices 2 and 5.

Especially on zigzag: Note that there must be used various unknown codes for the mother depending on whether the father is Landrace and Yorkshire. E.g. if the father is Landrace, the unknown code for the mother must be " 999999876 ", corresponding to a zigzag sow with a Yorkshire father, since the mother in a zigzag strategy by definition has the offspring's inverse father breed.

Report matings of the litter, which include animals of interest.

Report farrowing for the litter - which include animals of interest - on a farrowing record.

Subsequently, there will be on-going reporting as described in 7.1 (nucleus) and 7.2 (zigzag).

4.5 Registration of on-farm produced females of known breed and partly unknown origin

Females are registered by an entry record where the animals' ID number, entry date, date of birth, name (cf. 6) and the parents' ID numbers as ID codes for animals with known breed and unknown origin are stated, cf. appendix 1.

Especially on zigzag: note that there must be used various unknown codes for the mother depending on whether the father is Landrace or Yorkshire. E.g. if the father is Landrace, the unknown code for the mother shall be " 999999876 ", corresponding to a zigzag sow with a Yorkshire father, since the mother in a zigzag strategy by definition has the offspring's inverse father breed.

The ID number of the animal is created on the basis of the assigned herd number, the animal's name and year of birth. As an alternative to the animal's name, in the establishing phase it can be chosen to use 4-digit numbers between 9000-9999 as the consecutive digits in place 4-7 of the ID number of active sows. Cf. appendices 2 and 4.

Subsequently, there will be on-going reporting as described in 7.1 (nucleus) and 7.2 (zigzag).

4.6 Registration in boar nucleus

Sows and boars in a purebred boar nucleus are registered as reviewed in 4.2- 4.5.

Subsequently, there will be on-going reporting as described in 7.3.

5 Identification

- 5.1 The producer is recommended to mark his animals in accordance with the marking of animals in multiplier herds, cf. guidance set forth in 5.2.

Use of another marking system - than the one described in 5.2 - is permitted.

- 5.2 Marking of breeding animals according to the regulations of the PRC:

(a) ear-notching at birth

(B) Ear-tags with ID number are fitted at weaning

(c) Ear tags including the name are fitted at first mating/service

Ad(a) On the first day of life all females originating from litters with a Landrace or Yorkshire father are ear-notched with the last two digits of mother's name. Equally, all pigs from litters a with a purebred boar nucleus are ear-notched with the last two digits of mother's name.

Ad b) Purebred females, LY- /YL-gilts, zigzag-gilts and boars from boar nuclei are fitted at weaning with a plastic ear-tag with the herd number and a 4-digit unique serial number in the left ear. Purebred Landrace and Yorkshire pigs can also be tattooed rather than fitting the animals with plastic ear-tags.

It shall be observed that in a nucleus herd ear-tags are fitted on purebred gilts as well as hybrid gilts.

Approved plastic ear-tags from the PRC are pre-printed with:

- The breed or combination of breed (on the front of the tag)
- The herd number of the mother's accommodation herd (on front of the tag)
- The animal's individual, 4-digit serial number (on the front of the tag),
- Breed colour codes and serial numbers (number pools) should be applied as described in appendix 2.

Plastic ear-tags can be ordered and purchased from Breeding & Genetics. Should an ear-tag be lost, it must be replaced without delay by a new, approved ear-tag.

Ad (c) Boars and females are marked and given a name in the right ear at their first service/mating. Approved ear-tags may be used, only. Naming shall take place as described in 6.

6 Naming of breeding stock

- 6.1 For the purpose of the Pig Breeding Database's structure and error management the following instructions for naming of breeding stock shall be complied with.

Boar names may consist of a maximum of 6 characters, of which the first character, as a minimum, must be letters, which, if necessary, may be supplemented by figures. The letters "Æ", "Ø" and "Å" must not be used in boar names.

Only numbers and letters may be used in boar names - that is to say, no spaces or special characters.

Examples of correct boar names

1. Morten

2. DY1010

3. D111

Sow names must consist of numbers, thus, they must not contain letters, spaces or special characters. When submitting reports 4 (e.g. 0001) numeric characters in sow names must be used - that is to say, if the sow is called no. 1, it must be written "0001 and not "1".

Sow names, which are a multiple of 100 - that is to say, where the last two digits are zero e.g. " 100" and "9900 " - may not be used out of consideration for ear-notching of the offspring.

7 On-going registration and reporting

7.1 **Nucleus herds:**

On-going reporting to the Pig Breeding Database is carried out by submission of the following data to the Database, cf. a, b and c. It is recommended to submit data as often as possible, e.g. once a month. This is also applicable to purebred boar nuclei.

- (a) In nucleus herds, at a minimum all matings of Yorkshire and Landrace boars with purebred females are reported on a mating record.

Production matings may also be reported.

- (b) In nucleus herds the farrowing record must be submitted on all litters after Landrace and Yorkshire boars.

Purebred litters are reported with a farrowing record including the herd number and serial number for each born female of the litter. The amount of born pigs in this case is accounted for as all live births + fully developed stillborn pigs. Hereby an ID number will be allocated to all purebred females, which is unique and follows them the rest of their life.

Hybrid litters are reported with a farrowing record.

Production litters may also be reported.

- (c) Records of all "dead/culled/sold" breeding stock of the herd. Appendix 5 shows which codes can be used for exit.

7.2 **Zigzag herds:**

On-going reporting to the Pig Breeding Database is carried out by submission of the following data to the Breeding Office, cf. a, b, c and d. It is recommended to submit data as often as possible, e.g. once a month. Section a-d is also applicable in a zigzag boar nucleus; merely the Duroc-breed is used instead.

- (a) Mating record of matings with Yorkshire or Landrace boars.

Production matings may also be reported.

For females, which are mated for the production of zigzag litter, no restrictions with respect to the use of Landrace and Yorkshire boars do exist!

- (b) Farrowing records are submitted on all litters with Landrace and Yorkshire fathers.

The litters are reported with a farrowing record. Hereby an ID number will be allocated to all sows, which is unique and follows them the rest of their life. The amount of born pigs is accounted for as all live births + fully developed stillborn pigs.

Production litters may also be reported.

- (c) Records of all "dead/culled/sold" breeding stock of the herd. Appendix 5 shows which codes can be used for exit.

8 Management Tools

8.1 In connection to the Database, a range of management tools has been developed, which the herd owner can use on the website www.danavl.dk - the most important ones are:

- Herd report
- List of young animals
- List of born and unborn litters
- List of the use of boars
- List of missing registrations
- Lists of active and culled AI boars.

8.2 In appendix 3 it is shown who is given access to the lists in 8.1.

9 User payment

- 9.1. A fixed user payment per herd number is charged per year. The amount to be paid is listed on the website: http://vsp.lf.dk/Om_os/DanAvl/Aftaler_regler_afgifter.aspx at Rules for Breeding, 12.1 a.

For registration, the herd owner is charged the complete annual fee (following the calendar year). The participation fee will be invoiced on submission of the registration form for new DanAvl herds at Breeding & Genetics.

Whenever for a shorter period of time, a herd has been assigned two herd numbers, e.g. in connection with a change of the internal breeding strategy, the total participation fee shall be charged for the first herd number while the participation fee for the second herd number is differentiated for the period it is used, however, a minimum of 6 months.

- 9.2 Breeding & Genetics may, in individual cases, provide consultancy support against payment. Tariffs can be found on the website: http://vsp.lf.dk/Om_os/DanAvl/Aftaler_regler_afgifter.aspx at Rules for Breeding, Appendix 12, 12.2 and 12.3 .

This hourly rate applies to producers who make use of Breeding & Genetics in relation to specific tasks. Producers will bear all expenses in connection with the use of a local nucleus management counsellor.

Appendix 1 ID-codes for unknown parents

In relation to the registration of animals with unknown origin the application of special identification numbers and names is required. These are listed in the table 1 below.

Table 1. ID-no. for unknown and blind parents depending on breed and gender			
Breed and gender for unknown animals	Explanation	ID-no./ unknown code	Name*
Landrace boar	Unknown pedigree in the Database	999999475	0011
Landrace female	Unknown pedigree in the Database	999999375	
Yorkshire boar	Unknown pedigree in the Database	999999275	0022
Yorkshire female	Unknown pedigree in the Database	999999175	
LZ-female	Zigzag-female with unknown Landrace sire in the Database; e.g. LY	999999875	
YZ-female	Zigzag- female with unknown Yorkshire sire in the Database; e.g. YL	999999876	
Duroc boar	Unknown pedigree in the Database; e.g. commercial semen	999999975	0044
Duroc female	Unknown pedigree in the Database	999999775	
YD-boar	Unknown pedigree in the Database; e.g. commercial semen	999999474	0024
DY-boar	Unknown pedigree in the Database; e.g. commercial semen	999999574	0042
LD-boar	Unknown pedigree in the Database	999999274	0014
DL-boar	Unknown pedigree in the Database	999999374	0041
LY-boar	Unknown pedigree in the Database; e.g. commercial semen	999999074	0012
YL-boar	Unknown pedigree in the Database; e.g. commercial semen	999999174	0021
DZ-female	Zigzag-female with unknown Duroc sire in the Database	999999877	
* When reporting electronically aided by BEDRIFTSLØSNING SVIN®/AMOS the names for respective unknown boars can be used and the corresponding unknown ID number is added automatically.			

Appendix 2 Recommended use of ear-tags and number pools (serial numbers)

Table 1. Design of ear-tags for purebred animals in nucleus herds		
Combination of breed	Marking of purebred animals in purebred nucleus herd	
	Letters & colour on the outside of the ear	Colour on the inside of the ear
Yorkshire father + Yorkshire mother	YY – orange	Orange
Landrace father + Landrace mother	LL – blue	Blue
Duroc father + Duroc mother	DD – white	White
Combination of breed	Marking of hybrid animals from a purebred nucleus herd	
	Letters & colour on the outside of the ear	Colour on the inside of the ear
Yorkshire father + Landrace mother	YL - orange	Blue
Landrace father + Yorkshire mother	LY – blue	Orange

Note!. In purebred nucleus herds number pools should be allocated for the various combinations of breeding stock being produced in the nucleus. Cf. description on the next page.

Table 2. Design of ear-tags for animals in zigzag herds.		
Combination of breed	Marking of zigzag breeding stock.	
	Letters & colour on the outside of the ear	Colour on the inside of the ear
Yorkshire father + L(Z)-mother	YLZ – blue	Blue
Landrace father + Y(Z)-mother	LYZ – orange	Orange
Duroc father + Y(Z)-mother	DYZ – orange	Orange
Yorkshire + D(Z)-mother	YDZ – white	White

Note! In zigzag nucleus herds number pools should be allocated for the various combinations of breeding stock produced in the nucleus. Cf. description on the next page.

L(Z) = zigzag-female with Landrace father. Y(Z) = zigzag-female with Yorkshire father. D(Z) = zigzag-female with Duroc father.

Number pools (serial numbers):

Table 3 provides an example of how serial numbers from " 0001" to " 8999" can be distributed depending on the amount of categories within the breeding group. In general, the sequential numbering series ought to be adjusted to the individual farm. For example there is no need for a very high number series in a boar nucleus consisting of 2-5 Duroc sows. The specified serial numbers on the number series are only indicative - however, it has significance that various number pools are used for different categories of animals within the same breeding group.

Register numbers in herds with on-farm produced animals:

Please note that the number series " 9000-9999" in the example stated below is reserved for the start-up phase, where entails a need to assign breeding Identification numbers for sows, pregnant gilts and gilts (if necessary boars), which is already in use in the herd. Within these thousands of numbers it should also be distinguished between the different animal categories in the herd.

Table 3 Example of use of serial numbers in the number pools depending on the number of categories in breeding group						
#Serial numbers #Animal categories	1	2	3	4	5	6
1	0001-4999	-	-	-	-	-
2	0001-3999	4000-7999	-	-	-	-
3	0001-2999	3000-5999	6000-8999	-	-	-
4	0001-2999	3000-6999	7000-7999	8000-8999	-	-
5	0001-2999	3000-5999	6000-6999	7000-7999	8000-8999	-
6	0001-2499	2500-4999	5000-6499	6500-7999	8000-8499	8500-8999

Note: The specified serial numbers on the number series are only indicative - however, it has significance that there are different number pools for different animal categories within the same breeding group - thus it may be necessary to limit the numbers within a number pool in order to accommodate for a second category of animals.

Zigzag-herd; female line

There should be one number pool for zigzag females with Landrace fathers (orange ear-tags) and a number pool for zigzag females with Yorkshire fathers (blue ear-tags).

Zigzag-herd; boar line

There should be established one number pool for zigzag boars with Duroc fathers (orange ear-tags), and one number pool for zigzag boars with Yorkshire fathers (white ear-tags).

Landrace nucleus:

There should be established one number pool for purebred Landrace animals (blue ear-tags) and one number pool for YL-gilts (orange (outside of the ear) and blue tags (inside of the ear)).

Yorkshire nucleus:

There should be established one number pool for purebred Yorkshire animals (orange ear-tags) and one number pool for LY gilts (blue (outer surface of the ear) and the orange ear-tags (inside of the ear)).

Duroc boar nucleus:

There should be established one number pool for purebred Duroc animals (white ear-tags) and white ear-tags (inside of the ear) and YD-hybrids (orange (outside of the ear) and white ear-tags (inside of the ear)).

Appendix 3 Public level

Table 1. Public level in relation to management tools from www.danavl.dk			
	Who has access to which management tool via the internet		
Management tools	Producer	Consultant with producer's accept	N.N.**
Herd report	X	X	
List of young animals	X	X	
List over born litter	X	X	
List of unborn litter	X	X	
List of deficiencies	X	X	
Use of boars	X	X	
Partly anonymized hit list*	X	X	
Anonymized hit list			X
Breeding report	X	X	
Anonymized breeding report			X
<p>*The name of the producer's own herd will be apparent the overview. Consultants having access to several herds will be able to see the name of the particular herds.</p> <p>**This group covers consultants without acceptance from the producer and producers, who are not registered with the system.</p>			

Appendix 4 Breeding Identification number

Allocation of breeding-ID no. :

All DanAvI animals, which index is calculated, have a breeding-identification number that is unique to this particular animal.

A breeding-ID no. always consists of 9 digits. The first 3 digits are made up of the 3-digit herd number (= breeding group) from the herd in which the animal is born. What follows are 4 digits, which are made up of a serial number chosen from the number series that the animal's breed was assigned to in the particular herd. The last two digits of breeding-ID number consist of the animal's year of birth.

For example, the following is derived from breeding ID number " 999001506 ": The animal originated from a herd with herd number (=breeding group) " 999 ", and is assigned serial number " 0015 ", where it was born in 2006.

Animals, which are purchased from a breeding or multiplier herd within DanAvI, do always have a breeding-ID no. (cf. delivery and/or ear-tag), it is this 9-digit number that shall be used for the animal, when reporting breeding data.

Animals that are produced on-farm and shall be included in Nucleus Management, must be assigned a breeding-ID number, which is done according to the following procedure.

- Use the assigned DanAvI herd number as the first 3 digits of breeding-ID no.
- Use next available 4-digit serial number - in the number series the animal belongs to - as digit no. 4-7 in the breeding-ID no. In general, the oldest animals should have the lowest serial number in number pool.
- Use the animal's year of birth as the last two digits (no. 8-9) in the breeding-ID no.

Appendix 5 Codes for slaughtered /culled/sold animals

Table 1. Codes for use of deregistration of breeding stock from the Pig Breeding Database.	
Causes	Code/number
Died	11
Missing oestrus	12
Not pregnant	13
Poor milking abilities	14
Low index	15
Languish	16
Female sold as breeding stock	17
Granulomatous mastitis ("mammary abscesses")	18
Other	19
Shoulder ulcer, slaughtered	20
Shoulder ulcer, killed out	21
Vulva bite	22
Aggressive towards piglets	23
Paralyzed hindquarters, slaughtered	31
Paralyzed hindquarters, killed out	32
Bone fracture, killed out	33
Hoof problems, slaughtered	34
Hoof problems, killed out	35
Foreleg problems, slaughtered	36
Foreleg problems, killed out	37
Hind leg problems, slaughtered	38
Hind leg problems, killed out	39
Too few live borns	40
Too many stillborns	41
Spayed legs in offspring	42
Gilt sold as breeding stock	43
Gilt, slaughtered	44