

出國報告（出國類別：考察）

參訪荷蘭畜牧業管制策略

服務機關：行政院環境保護署

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第一章 前言（目的）

國內畜牧業由早期小規模、家庭副業等方式，逐漸發展為現在的專業集約式經營，又因地處亞熱帶，氣候長年溫濕，牲畜畜養過程中所產生的大量廢水、廢棄物，使得微生物極易滋生所衍生的異味問題（如氨、硫化氫、硫醇等）。因此本署於 96 年針對已登記的畜牧場，將異味污染物排放限值由原規定 50 下修為 30，藉以強化畜牧業異味管制。

依據「環保報案中心公害陳情案件管理系統」統計，102 年畜牧業陳情 554 案件數仍持續成長至 104 年的 604 件數，顯示國內畜牧業異味問題仍有改善空間。因此除藉由評析國、內外畜牧業管制方式了解管制現況及其差異性，此次規劃透過考察國外畜牧業管制方式，提供國內擬定畜牧業異臭味管制制度參酌。彙整國外畜牧業管制方式如表一所示，主要可分為源頭減量與後端防制兩種類型。源頭減量主要以設定緩衝區距離、密閉飼養及逸散減量為主，如澳洲規範住宅區與畜牧業畜舍其緩衝區應達 250 公尺以上；且規定其新設之畜牧業者應以密閉方式進行牲畜飼養；美國則針對畜牧業擴大須提出異味削減方案，內容包括減少異味的預防和具體措施，如廢棄物貯存、土地規劃及廢水處理系統以減少異味逸散。後端防制如加裝防制設備與訂定周界濃度排放標準。由於畜牧業異味逸散程度依個人感官有所不同，美國加州(California)、維吉尼亞州(Virginia)、威斯康辛州(Wisconsin)及懷俄明(Wyoming)規範畜牧業陳情案件成立條件，空氣污染防制單位於 90 天期間內接獲 10 次以上的申訴，才能以惡臭管制法令規範，且陳情案件成立後將維持一年之有效性，如再次於 90 天期間內接獲 5 次以上的申訴，惡臭法令再次生效(林錕松，2012)。

表 1-1 國外針對畜牧業管制方式

管制方式 國家	緩衝區	密閉飼養	異味削減 方案	周界濃度 排放標準	陳情案件 數規範
荷蘭	√				
日本				√	
美國	√		√	√	√
德國	√				
澳洲	√	√	√		

資料來源：2016 餐飲業及空氣污染行為管制暨加油站油氣回收制度管理計畫彙整

本次出國考察規劃參訪荷蘭 Swine Innovation Centre (VIC)研究中心及當地 Giethoorn、Goat farm Ridammerhoeve 畜牧場，並分別針對畜牧業管制策略、法令規範、實施現況及技術成果及畜牧農場設置、經營及畜養方式進行訪談，蒐集有益於我國訂定畜牧業異臭味相關管制規範。選擇前述研究中心及畜牧場原因可分為政策、技術與實務三方面進行探討，簡述如下：

- 一、政策面：為避免畜舍對臨近住宅區產生影響，荷蘭設立基礎設施和環境部（荷蘭語：Ministerie van Infrastructuur en Milieu；英文：Ministry of Infrastructure and the Environment）專門針對畜牧業所產生臭味進行管理與控制單位，依據飼養規模規範住宅區和畜牧業畜舍間最小距離。
- 二、技術面：瓦赫寧恩 UR 是荷蘭農業研究的頂尖的大學，也是歐洲農業領域最好的研究型大學之一，在農業學科方面的研究機構中其排名為世界第二；於 Sterksel 豬創新中心(VIC)為瓦赫寧恩大學及研究的生豬養殖研究試驗設施。荷蘭瓦赫寧恩透過此研究中心進行相關研究，如飼料改良、污染排放量及家畜健康等。
- 三、實務面：參訪荷蘭當地 Giethoorn、Goat farm Ridammerhoeve 畜牧場，透過實際業者營運管理及設置規定等，考察實際業者針對畜牧業異臭味污染防制措施等。

第二章 參訪行程及內容

本次出國期程為 105 年 12 月 19 日至 105 年 12 月 23 日，共 6 日，行程表詳如表 2-1。

表 2-1 本次參訪行程及內容

日期			地點		行程	工作內容
月	日	週	起	訖		
12	19	一	臺北	荷蘭	去程	去程航班CI73 臺北時間00:05臺灣桃園國際機場起飛 荷蘭時間07:15抵達阿姆斯特丹史基普機場
12	20	二	阿姆斯特丹	羊角村	參訪當地居民畜養放牧方式	參訪Giethoorn當地居民養殖放牧方式；羊角村早期以挖煤為主，今日以務農、放牧或經營民宿為主，多數農家於自家外草地放牧，飼養少數牛羊。
12	21	三	阿姆斯特丹	斯泰克瑟爾	參訪Swine Innovation Centre	參訪Swine Innovation Centre (VIC)研究中心，了解荷蘭養殖豬隻區域、進出口及近期研究等，並與研究人員討論對於畜牧場異味管理及其改善方式
12	22	四	阿姆斯特丹	阿姆斯特爾芬	參訪Goat farm Ridammerhoeve	參訪位於Amstelveen(阿姆斯特爾芬)的Goat farm Ridammerhoeve(山羊牧場)，考察當地畜牧農場設置及經營方式
12	23	五	荷蘭	臺北	返程	返程航班CI74 荷蘭時間12/23 15:50阿姆斯特丹史基普機場起飛
12	24	六	-	-	返程	臺北時間12/24 12:20抵達台灣桃園國際機場

第三章 本次參訪及考察內容

3.1 政策面

荷蘭對於畜牧業的管制部分，於環境類別訂定畜牧業及其異味相關設置許可法規(Wet geurhinder en veehouderij)，主管機關依條文內容規定於不同區域（如城市地區或郊區）設置畜牧場應符合其臭味值及與受體最小距離，法規內容詳如附件一，並另有部會級法令公告畜牧業動物類別與飼養環境單位產生之異味排放與最小距離轉換排放因子(Regeling geurhinder en veehouderij)，法規內容詳如附件二。

3.2 技術面

瓦赫寧恩大學暨研究中心為荷蘭 14 所研究所大學之一，是荷蘭農業研究頂尖的大學，亦為歐洲農業領域為首之研究型大學，與聯合國農糧組織(Food and Agriculture Organization of the United Nations, FAO)有多項合作計畫，更是唯一由荷蘭經濟及農業創新部(Ministry of Economic Affairs, Agriculture and Innovation)所贊助的研究單位。位於荷蘭南部 Sterksel 城市的豬創新中心(VIC)為瓦赫寧恩大學暨研究中心所屬之豬養殖研究試驗設施，為荷蘭重要之豬隻發展研究機構。透過此研究中心進行研究養豬的不同方面，如飼料、畜舍環境、污染排放、礦產管理和健康等面向。歐盟官員代表於 2016 年 5 月 30 日至 VIC 參訪瞭解最新研究，並進行：1.母豬及其仔豬的多次哺乳、2.成品豬（稱為 Starplus）的整體可持續穩定性生長和處理豬異味的清潔設施及方式、3.VIC Sterksel 購買氣味耐用工作服，以便遊客可以很容易地進入農場等三個議題進行討論。

VIC 基於國際發展趨勢，設定養豬產業之 4 項發展構面：1.確保動物健康（降低抗生素使用）、2.強化友善飼養（提高動物福利）、3.建立產業形象及教育功能（加強與消費者對話溝通）、4.符合環境永續（節能與環保），在研擬各項研究時均堅守前開策略目標，目前畜養 385 頭母豬及 2,400 頭肥育豬隻進行各類試驗，且為確保研究領域站穩國際領先地位，每 7 年全場建築設備均會全數更新，目前執行中之計畫項

目分述如下：1. 懷孕母豬開放式狹欄、群養個飼系統 2. 可調式分娩架、開放式分娩欄、豬仔離乳前飼育模式、家庭欄舍(Family Pen) 採 4 頭母豬及其豬仔併養，滿足其社交行為需求 3. 畜舍環境豐富化（提供刷毛磨背、玩具、壁面繪圖等）及豬隻水床 4. 豬欄中「用餐區-休憩區-豬廁所」之設計規劃，運用不同材質及溫度控制，使豬隻分辨用餐、休憩及廁所區 5. 豬仔行為教育區。

透過母豬與仔豬習慣及喜愛的環境溫度，訓練豬隻養成排泄及休憩不同位置的習性，並於仔豬出生後 18~25 天離開哺乳期時，開始訓練以利後續養豬場糞尿集中處理定期更換糞肥(manure)，如圖 3-2(a)，並透過飼養環境以低溫控制系統，探討飼養低體溫母豬的影響，如圖 3-2(b)，如重量增加或繁殖數量。本次參訪研究中心流程及照片如下所示。研究中心簡報內容詳如附件三。

表 3-1 參訪 VIC 研究中心流程

時間	內容
13:00-13:45	研究中心簡介及近期研究
13:45-14:00	盥洗及更換工作服
14:00-16:00	參訪母豬飼養研究區及問題討論

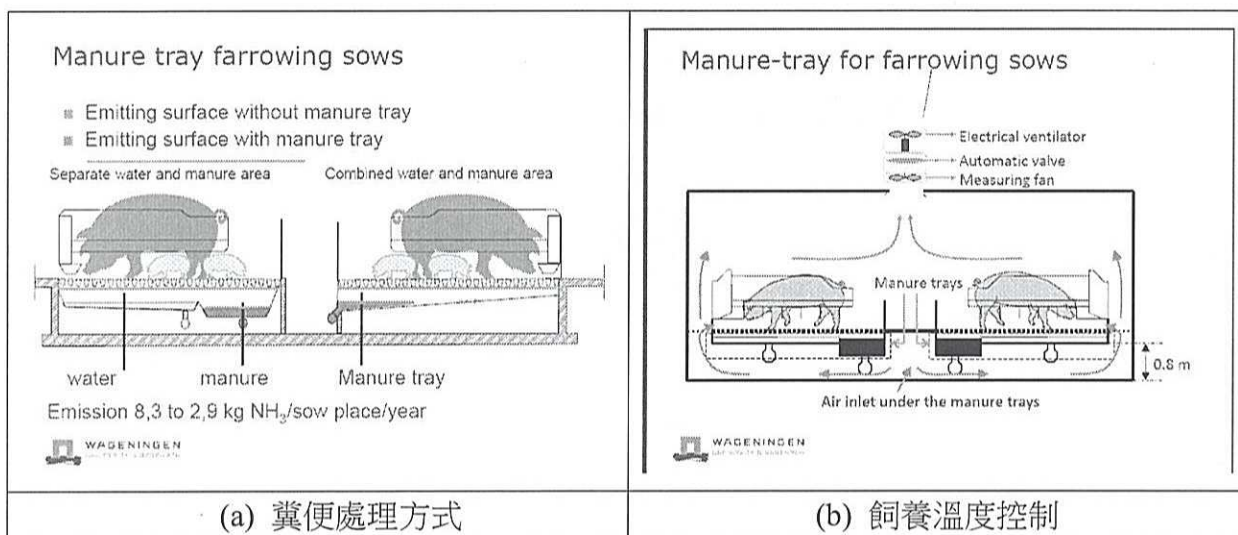


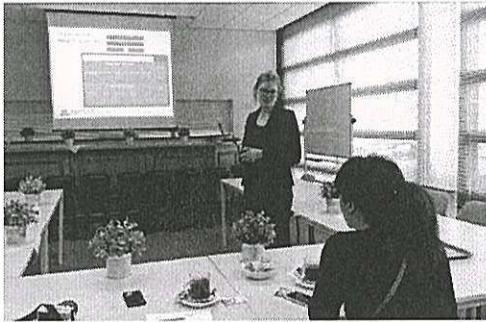
圖 3-1 母豬飼養區研究方式



VIC Sterksel 豬創新中心



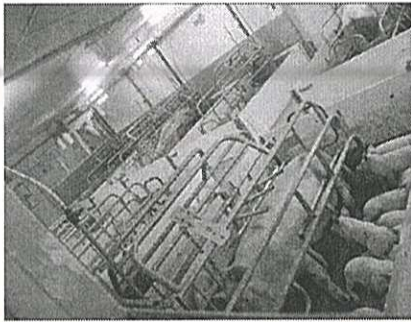
研究中心外標誌



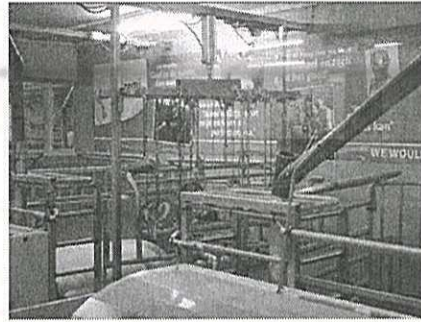
研究中心簡介及近期研究



母豬飼養研究區參訪



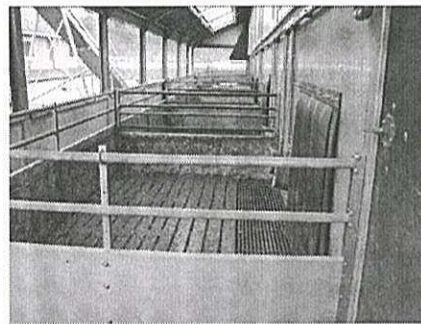
豬仔離乳前飼育模式



提供豬仔玩具



開放式分娩欄設計介紹



開放式分娩欄

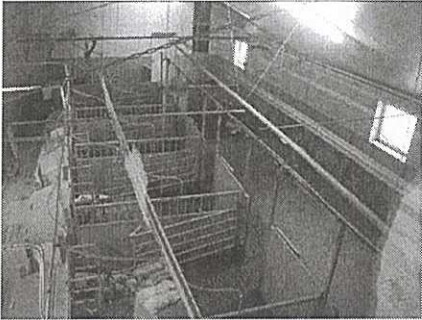
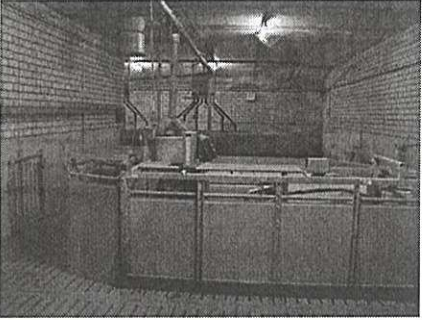

	
<p>家庭欄舍(Family Pen)</p>	<p>懷孕母豬群養個飼系統</p>
	
<p>豬仔行為教育區</p>	<p>與研究中心人員合影</p>

圖 3-2 參訪研究中心情形

表 3-2 與研究人員討論議題及其回覆內容

討論議題	回覆內容
<p>1. 降低異味陳情，法規制定之最小安全距離(MDS)</p> <ul style="list-style-type: none"> ● 新設或變更畜牧場時，模擬量測 MDS 由業者負責或是政府單位? ● 如由政府所負責，則是哪個部門單位? ● 如新建/擴建畜牧設施，哪個政府部門必須審查及確認 MDS 之準確性 	<p>在荷蘭環境法規中有制定畜牧業及異味之法規，訂有畜牧場設置應視設置地區，規定與受體之緩衝距離。</p>
<p>2. 關於 MDS</p> <ul style="list-style-type: none"> ● 法規條文是否有訂定如何計算 MDS? ● 異味強度的計算主要關鍵為何? 	<p>在荷蘭“農業環境管理法令”中訂有異味排放和牲畜房舍之法令並符合歐盟環境農業指令。</p>
<p>3. 技術推廣部分</p> <ul style="list-style-type: none"> ● 新的技術亦或改良飼料，政府單位是否會協助推廣或補助嗎? 	<p>政府單位不會協助推廣或補助使用，廠商會自行提供畜牧業者技術介紹及成本分析，畜牧業者則以成本考量是否使用。</p>

3.3 實務面

本次參觀的農場為 Goat Farm Ridammerhoeve，位於荷蘭北荷蘭省阿姆斯特爾芬市（荷蘭語：Amstelveen）內的阿姆斯特丹森林（荷蘭語：Amsterdam Bos）中心的農場。此有機農場大多飼養山羊，有些飼養區亦有共同飼養豬或牛，農場中亦有飼養馬及雞。此農場內亦販售自製乳酪、優格、奶油、脫脂鮮乳，新鮮乳酪及冰淇淋等。農場自給養殖牲畜至生產相關製品，有時訪客至此農場，亦可實際觀看農場如何生產自製相關製品過程。

農場內有提供山羊休憩及奔跑運動的區域，亦提供訪客遊玩也可購買餵養動物牛奶或飼料。此農場定期舉辦自製山羊奶酪體驗活動自費行程，亦可詳細了解農場營運狀況及山羊養殖並提供新鮮羊乳。

於荷蘭新增畜牧場，業者須主動與當地鄰近居民進行溝通，業者須提供當地居民有利的需求及承諾（如提供假日遊玩休憩地），且需同時發展觀光及回饋鄰近居民。因此，多數居民非常樂意至畜牧場與動物接觸及購買自製畜牧製品。



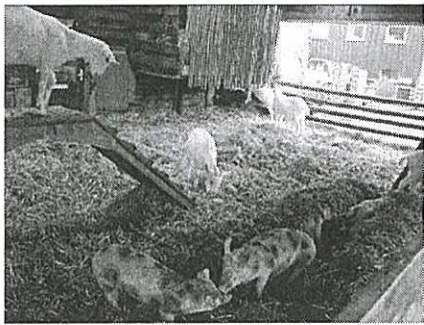
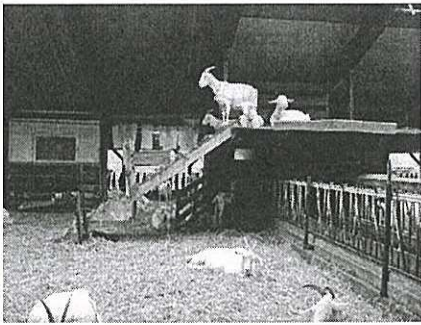
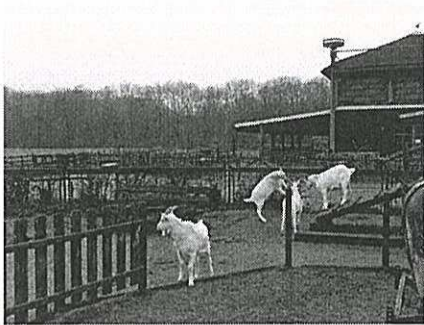

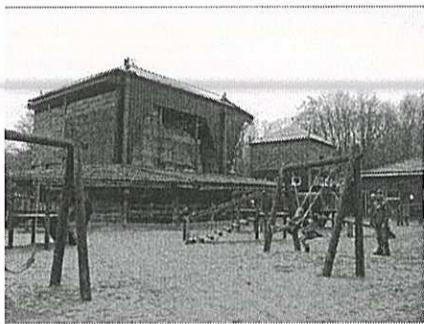
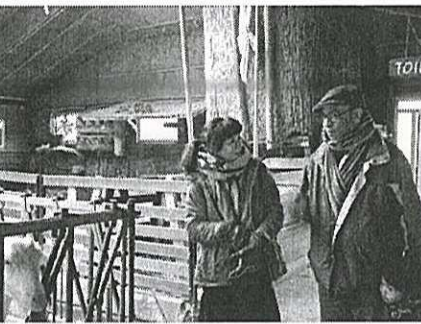
	
<p>豬羊於同一飼養休憩區</p>	<p>山羊休憩區</p>
	
<p>提供山羊大範圍自由奔跑運動區域</p>	
	
<p>農場提供遊憩設施</p>	<p>與參觀訪客了解對於農場設置看法</p>

圖 3-3 參觀當地農場情形

第四章 本次參訪心得及建議

- 一、 本次參訪除瞭解荷蘭當地豬隻養殖區域、進出口及近期研究等背景說明簡報外，同時參訪研究中心內依據不同飼養區塊進行說明並請教如何管理豬隻排泄糞尿等進行討論。研究人員表示，透過母豬與仔豬習慣及喜愛的环境溫度，訓練豬隻養成排泄及休憩不同位置的習性，並於仔豬離開哺乳期時，開始訓練，以利後續養豬場糞尿集中處理。檢視國內自民國 99 年底至 101 年間推動豬廁所政策，主要目的為減少清洗豬尿糞的廢水用量及臭味散發，其做法是利用 1 平方公尺大小的簡易型排糞架，透過消臭、植糞、馴養等過程，讓豬隻固定集中排泄於排糞架，除了方便清理、減少臭味並能減輕污染。
- 二、 荷蘭法規(Omgevingsrecht) 訂定飼養各類動物一定數量以上須符合畜牧場法規，針對畜牧場異味問題，除訂定住宅區與畜牧場的緩衝距離，亦規定畜牧場周界濃度與場內濃度比需降低 85%及飼料改良等相關管制規範。以目前荷蘭飼料改良業者，主要分析更換糞肥成本及運用其飼料之成本並提供給畜牧業者，畜牧業者可依據成本考量選擇適合之方式，但政府單位不會介入協助推廣。
檢視國內畜牧業相關法規，目前農委會亦有公告指定之飼養規模（豬 20 頭、羊 100 頭、牛 40 頭、雞或鴨 500 隻）以上者，應申請畜牧場登記進行納管須符合放流水排放準（非草食性動物，如豬、雞、鴨等 BOD = 80 mg/L、COD= 600 mg/L、SS= 150 mg/L；草食性動物，如牛、羊 BOD = 80 mg/L、COD= 450 mg/L、SS= 150 mg/L）及異味排放標準(30)，目前國內亦有飼料改良業者，作法於飼料內添加 4%比例的多功能酵素，使豬隻可提高營養吸收、並且強化抗病力及免疫力。但目前國內針對住宅區與畜牧場尚未訂定緩衝距離，因此有畜牧場設置早於住宅區但屢遭陳情被迫遷場之現況問題，因此建議異味模擬與緩衝距離訂定可納入畜牧業異味管制規範項目。
- 三、 實際參訪荷蘭當地畜牧場 Goat farm Ridammerhoeve，該養羊農場係採開放式牧草養羊，並有與豬及牛共養狀況，而農場內更有由農場中羊隻所生產羊乳製程的羊製品販賣等，農場內亦有提供旅客餐飲及遊玩等設施，並有販賣飼料及牛奶餵養。

檢視目前國內畜牧場如位於苗栗縣飛牛牧場、南投的清境農場亦有提供牧場體驗如動物農莊、生態諮詢等相關活動。

- 四、 於荷蘭如需設置新畜牧場，業者須與當地鄰近居民進行溝通協調，業者須提供當地居民有利的需求及承諾（如提供假日遊玩休憩地），畜牧設置前應依法規規定，依據設置區域所規範之緩衝距離才符合設置許可；當設置完成則須符合畜牧法規中規範畜牧場須符合之規定，且畜牧場需同時發展觀光及回饋鄰近居民。
- 五、 藉由本次參訪行程，雙方不僅建立初步的友誼，也為未來對於荷蘭畜牧業法規部分建立諮詢管道。

Law odors and livestock (Applicable from 01-01-2013)

Act of October 5, 2006, containing rules on odor nuisance due to farms belonging animals (Law odors and livestock)

All who shall see or hear these presents! Be it known:

Thus, we have considered that it is desirable to lay down rules regarding decisions on licenses under the Environmental Management Act for livestock, as far as odor due to these farms belonging animal shelters;

So it is that We heard the Council of State, and in consultation with the States General, have approved and decreed as We hereby approve and decree:

Article 1

In this Act and the provisions based on the following definitions apply:

concentration: concentration or concentration South East as set out in Annex I of the manure , or an area designated as such in municipal regulation;

animal shelter: whether indoor space in which animals are kept;

odor emission factor: by ministerial regulation adopted odor emissions per animal, corresponding to a designated animal category and housing system;

odor-sensitive object: building, designed for and suited apparent nature, layout and design to be used for human living or human residence and who had permanent or a similar method of use, is used, inter «building intended for human living or human habitat "means building on the basis of the zoning referred to in Article 3.1 of the planning Act , a land-use plan as referred to in Article 3.26 or 3.28 of the Act includes, the management regulation referred to in Article 3.38 of that Act or, if pursuant to Article 2.12, first paragraph, of the Act on general provisions environmental law has deviated from the zoning or management regulation, the environmental permit referred to in Article 1.1, first paragraph, of that law may be used for human living or human residence;

odor: impact on the environment through the emission of odor;

accommodation system: part of an animal, which animal one animal category are kept in the same way;

living environment: environmental permit for an activity referred to in Article 2.1, first paragraph, under e, of the Environmental Law General Provisions ;

livestock : establishment to under Article 1.1, third paragraph, of the Act on General Provisions Environmental Law belongs designated category and is intended for breeding, fattening, keeping, trading, shipping or weighing animals.

Article 2

- 1 A decision on the environmental permit for the construction or modification of livestock the competent authority shall take the odor nuisance by odor nuisance due to farms belonging animal enclosures as shown only as directed by or pursuant to Articles 3 to 9 .
- 2 The first paragraph does not apply to the refusal of the environmental permit on the grounds that by granting them not to Article 2.14, paragraph c, under 1 ° of the General Provisions environmental law can be met and rules applying the provisions under Article 2.22, third paragraph, of the Act or Article 1.3c or 8.40 of the environmental Management Act are made to ensure that at least the best available techniques are applied to eligible livestock in animal husbandry.
- 3 Notwithstanding the first paragraph of Article 1.1a of the Act on General Provisions environmental law by analogy to taking a decision as referred to in that paragraph. The first sentence shall not apply to cases provided for in Article 3, second paragraph , as far as an odor-sensitive object on or after March 19, 2000 has ceased to be part of another livestock, and Article 14, second paragraph .

Article 3

- 1 An environmental permit concerning a livestock shall be denied if the odor of that holding in an odor-sensitive object is located:
 - a. in a concentration, within the urban area of more than 3.0 odor units per cubic meter of air;
 - b. within a focal area, outside the urban area exceeds 14.0 odor units per cubic meter of air;
 - c. outside of a concentration, within the urban area of more than 2.0 odor units per cubic meter of air;
 - d. outside a focal area, outside the urban area of more than 8.0 odor units per cubic meter of air.
- 2 Notwithstanding the first paragraph, the distance between a livestock and an odor-sensitive object that is part of another livestock, or on or after March 19, 2000 has ceased to be part of another livestock:
 - a. at least 100 meters if the odor-sensitive object within the urban area is located, and
 - b. at least 50 meters if the odor-sensitive object outside of the village is situated.
- 3 If the odor nuisance referred to in the first paragraph is greater than indicated in this paragraph or the distance specified in the second paragraph, is less than indicated in this paragraph, an environmental permit, notwithstanding the first and second

paragraphs, not refused if the odor does not increase and the number of animals does not increase one or more of those categories.

- 4 If the odor nuisance referred to in the first paragraph is greater than indicated in this paragraph, increasing the number of animals of one or more animal categories and an odor-reducing measure will be applied, an environmental permit is granted as far as the amendment of the number of animals, provided that the increase of odor nuisance caused by that change does not exceed half of the reduction of odor which might be due to the applied load odor-reducing measure to the previously licensed livestock.

Article 4

- 1 The distance between an animal husbandry where animals are kept in an animal category for which no odor emission factor is determined by ministerial regulation, and an odor-sensitive object is:
 - a. at least 100 meters if the odor-sensitive object within the urban area is located, and
 - b. at least 50 meters if the odor-sensitive object outside of the village is situated.
- 2 Notwithstanding the first paragraph, the distance or the odor emission factor for fur animals is determined by ministerial regulation.
- 3 If the distance specified in the first or second paragraph, is less than indicated in this paragraph, an environmental permit, notwithstanding those members refused if the distance between the livestock and the odor-sensitive object within the first or second paragraph referred to remotely located, not decreasing, and the number of animals of one or more animal categories for which no odor emission factor is determined not increase.

Article 5

- 1 Subject to [Articles 3](#) and [4](#) , the distance from the outside of an animal to the exterior of an odor-sensitive object:
 - a. at least 50 meters if the odor-sensitive object within the urban area is located, and
 - b. at least 25 meters if the odor-sensitive object outside of the village is situated.
- 2 If the distance specified in the first paragraph, is less than indicated in this paragraph, an environmental permit shall, notwithstanding paragraph refused if the distance referred to in the first paragraph, not decreasing and:
 - a. the odor of the odor-sensitive object is located within the distance mentioned in the first paragraph, and the number of animals of one or more animal categories, not increase, or
 - b. in [Article 4](#) distance between the livestock and the odor-sensitive object referred situated within the distance referred to in the first paragraph, not

decreasing, and the number of animals of one or more animal categories for which no odor emission factor is determined not increase.

Article 6

- 1** may be determined by municipal ordinance that within a part of the territory of the municipality of another value whichever is the appropriate value specified in Article 3, first paragraph , provided that such other value:
 - a. in a concentration, within the urban area is not less than 0.1 odor units per cubic meter of air, and no more than 14.0 odor units per cubic meter of air;
 - b. within a focal area, outside the urban area is not less than 3.0 odor units per cubic meter of air, and no more than 35.0 odor units per cubic meter of air;
 - c. outside of a concentration, within the urban area is not less than 0.1 odor units per cubic meter of air, and no more than 8.0 odor units per cubic meter of air;
 - d. outside a focal area, outside the urban area is not less than 2.0 odor units per cubic meter of air, and no more than 20.0 odor units per cubic meter of air.
- 2** may be determined by municipal regulation provides that a fix to that Regulation other value or surrender pursuant to Article 3 or 4 applies for odor-sensitive objects that have been part of a livestock farming.
- 3** At municipal regulation may provide that another distance is applicable than the distance specified in inner part of the territory of the municipality of Article 4, first paragraph , provided that it:
 - a. at least 50 meters is where the odor-sensitive object within the urban area is located, and
 - b. at least 25 meters is where the odor-sensitive object outside of the village is situated.
- 4** In municipal regulation may provide that within a part of the territory of the municipality for fur another distance is applicable provided that it is at least half the distance referred to in Article 4, second paragraph .

Article 7

- 1** To avoid an area less suitable for the achievement of the regulation referred to in Article 6 , to achieve the objective, the council may decide that a decision on an application in anticipation of the Regulation for the creation or modification of a livestock is arrested.
- 2** The detention decision is determined for which area it holds and from the day it enters into force.
- 3** An arrest shall expire on the date on which the regulation in preparation which the decision enters into force. An arrest decision also lapse if, within one year from the date of entry into force, the design was brought to the Regulation on the Board or the Regulation entered into force within two years from the date of entry into force.

4 An arrest shall be published by public inspection of this Decision. Article 3:42 of the General Administrative Law Act applies. Of the arrest decision notice will also be done electronically.

5 It holds authority, notwithstanding administrative law section 3:18 of the Act , the decision on where the area covered by the livestock sector will be created or changed a detention decision entered into force before the date of receipt of the application. The detention lasts until the arrest decision has lapsed in accordance with paragraph.

Article 8

1 In determining the other value or distance, referred to in Article 6 , the Council includes in any case:

- a. the current and foreseeable situation because of the smell farms in the area;
- b. the importance of an integrated approach to pollution;
- c. the need for an equally high level of protection of the environment.

2 In determining the other value or distance the council also involves:

- a. the desired spatial layout of the area, or
- b. the abnormal relationship between odor and odor.

Article 9

When an area referred to in Article 6, a different value or other remote than those mentioned in Articles 3 or 4 shall be determined, and the effect due to the adoption of such other value or distance effect for the territory of a neighboring municipality, may City council only do so after consultation with the neighboring municipality.

Article 10

By regulation of Our Minister of Housing, Spatial Planning and Environment, in agreement with Our Minister for Agriculture, Nature and Food Quality, set rules on how:

- a. the odor nuisance referred to in Article 3 shall be determined;
- b. The distance referred to in Articles 3 and 4, first paragraph , is measured.

Article 11

[Red: Changes the Interim city and environmental approach.]

Article 12

[Red: Changes the General Administrative Law.]

Article 13

The Act on odor emissions from livestock in agricultural development and verwevingsgebieden withdrawn.

Article 14

1 Where an application for authorization submitted before the time when this law with respect to such application takes effect, the law in force at that time in respect of such

application shall continue to apply until the date on which the decision became final on request .

2 For the purposes of Articles 3 , 4 and 6 , the distance between a livestock and a house that is built on or after March 19, 2000:

- o **a.**on land that was in use at that time as livestock,
- o **b.**in conjunction with the full or partial decommissioning of the livestock, and
- o **c.**in connection with the demolition of the buildings that have been part of the livestock, at least 100 meters if the property is located within the urban area and at least 50 meters if the house outside of the village is situated.

3 The second paragraph shall apply mutatis mutandis to an odor-sensitive object that is present on the plot mentioned in that paragraph.

Article 15

This Act shall come into force on a date to be determined by Royal Decree.

Article 16

This Act may be cited as the odor and livestock.

第 1 條

在本法案和基於以下定義的條款適用：

濃度：濃度或濃度，如附件 I 所列的東南地區，或在市政法規中指定的地區；

動物庇護所：是否存放動物的室內空間；

氣味排放因子：通過部級法規採用對應於指定動物類別和住房系統的每隻動物的氣味排放；

氣味敏感物體：建築物，設計用於並適合用於人類生活或人類居住的表觀性質，佈局和設計，並具有永久或類似的使用方法，用於人類生活或人類棲息地“是指根據規劃法第 3.1 條所述的分區建設，該法第 3.26 條或第 3.28 條所述的土地利用規劃包括該法第 3.38 條所述的管理規章，如果根據“環境法”一般條款法第 2.12 條第一款偏離了分區或管理規定，該法第 1.1 條第 1 款所述的環境許可證可用於人類居住或人類居住；

氣味：通過排放氣味對環境的影響；

住宿系統：動物的一部分，動物的一種動物類別以相同的方式保存；

生活環境：環境法一般規定第 2.1 條第 1 款 e 項所指活動的環境許可證；

牲畜：根據“一般性條款法”第 1.1 條第 3 款的規定，環境法屬於指定類別，用於飼養，育肥，飼養，貿易，運輸或稱重動物。

第二條

1 關於建造或改造牲畜的環境許可證的決定主管當局應根據或按照第 3 條至第 9 條的指示，對屬於動物圍欄的養殖場產生的氣味滋擾帶來氣味滋擾。

2 第一段不適用於環境許可證的拒絕，理由是它們不能根據“總則”第 1 條第 2 款第 14 條第 c 項，可以滿足環境法的規定，適用第 2.22 條，第三段或“環境管理法”第 1.3c 或 8.40 條，以確保至少最佳可行技術適用於畜牧業中符合資格的牲畜。

3 儘管有“環境法”一般條款第 1.1a 條的第一段，類似於該段所提及的決定。第一句不適用於第三條第二款規定的情況，只要 2000 年 3 月 19 日或以後對氣味敏感的物體已不再是另一隻家畜的一部分，以及第 14 條第 2 款。

第三條

1 如果存在於氣味敏感物體中的氣味存在，則關於牲畜的環境許可證應被拒絕：

- a。在城市地區內，每立方米空氣含有超過 3.0 個氣味單位；
- b。在重點區域內，市區外每立方米空氣超過 14.0 個氣味單位；
- c。在濃度以外，在市區內每立方米空氣的氣味單位超過 2.0 個；
- d。在焦點區外，市區外每立方米空氣臭氣單位超過 8.0 個。

2 儘管有第一段，在 2000 年 3 月 19 日或之後，牲畜與作為另一隻家畜一部分的氣味敏感物體之間的距離已不再是另一種牲畜的一部分：

- a。如果城市區域內的氣味敏感物體位於至少 100 米處，

b。如果村外的氣味敏感物體位於至少 50 米。

3 如果第一段所述的氣味妨害大於本款所指明的臭味或第二段所指明的距離小於本段所指明的距離，即使第一及第二段規定，環境許可證亦不得拒絕，如果氣味不增加，動物數量不增加這些類別中的一個或多個。

4 如果第一段中提到的氣味妨害大於本段所述的氣味妨害，則增加一個或多個動物類別的動物數量，並應用減少氣味的措施，就修正案授予環境許可條件是由該變化引起的氣味滋擾的增加不超過氣味減少的一半，這可能是由於對先前獲得許可的牲畜施加負荷氣味減少措施。

第 4 條

1 動物被保存在動物類別中的動物飼養場與氣味敏感對象之間的距離為：氣味排放因子不由部級調節決定，

a。如果城市區域內的氣味敏感物體位於至少 100 米處，

b。如果村外的氣味敏感物體位於至少 50 米。

2 儘管有第一段，毛皮動物的距離或氣味排放因子由部長規章決定。

3 如果第一或第二段規定的距離小於本段規定的距離，則儘管這些成員拒絕，但如果家畜與第一或第二段內的氣味敏感物體之間的距離涉及遠距離，不減少，並且確定沒有氣味排放因子的一個或多個動物類別的動物數目不增加。

第 5 條

1 根據第 3 條和第 4 條，從動物外部到氣味敏感物體外部的距離：

a。如果市區內的氣味敏感物體位於至少 50 米處，

b。如果村外的氣味敏感物體位於至少 25 米。

2 如果第一段規定的距離小於本段規定的距離，則環境許可證即使在第一段所述距離沒有減少的情況下拒絕，而且：

a。氣味敏感物體的氣味位於第一段所述的距離內，並且一個或多個動物類別的動物數量不增加，或者

b。在第 4 條中，家畜和位於第一段所述距離內的氣味敏感物體之間的距離不減小，並且確定沒有氣味排放因子的一種或多種動物種類的動物數量不增加。

第六條

1 可以由市政法規確定，在市政領土的一部分範圍內另一價值，以第三條第一款規定的適當價值為準，但其他價值：

a。在城市地區內，每立方米空氣不少於 0.1 個氣味單位，每立方米空氣不超過 14.0 個氣味單位;

b。在重點區域內，市區外的每立方米空氣不少於 3.0 個氣味單位，每立方米空氣不超過 35.0 個氣味單位;

c。在濃度以外，市區內每立方米空氣不少於 0.1 個氣味單位，每立方米空氣不

超過 8.0 個氣味單位;

d. 在焦點區外，市區外的每立方米空氣不小於 2.0 個氣味單位，每立方米空氣不大於 20.0 個氣味單位。

2 可以由市政法規確定，規定根據第 3 條或第 4 條對該法規的其他價值或投降的定義適用於已成為畜牧業一部分的對氣味敏感的物體。

3 在市政法規可以規定，另一個距離適用於第 4 條第 1 款所在地區域內部規定的距離，但前提是：

a. 至少 50 米是市區內的氣味敏感物體所在的地方

b. 至少 25 米是村外的氣味敏感物體所在的地方。

4 在市政法規中可規定，在市政領土的一部分範圍內，另一距離適用，但前提是其至少為第 4 條第 2 款所述距離的一半。

第 7 條

1 為了避免不太適合實現第 6 條所述的規定的領域，為了實現目標，理事會可以決定，預期關於設立或改變牲畜的條例的申請的決定被逮捕。

2 拘留決定取決於其所在的地區和從其生效之日起。

3 逮捕應在決定生效的擬訂條例之日屆滿。如果在生效之日起一年內，委員會對規章或規則提出的規定自生效之日起兩年內生效，則逮捕決定也失敗。

4 公開檢查本決定應公佈逮捕。適用“一般行政法”第 3:42 條。逮捕決定通知也將通過電子方式完成。

5 儘管有行政法第 3:18 條規定，它有權決定畜牧部門所覆蓋的區域將在何處創建或改變，但拘留決定在收到申請之日前生效。拘留持續到根據段落逮捕決定失效為止。

第八條

1 在確定第 6 條所述的其他價值或距離時，理事會在任何情況下包括：

a. 由於該地區的氣味農場的當前和可預見的情況;

b. 污染綜合方法的重要性;

c. 需要同等高水平的環境保護。

2 在確定其他價值或距離時，理事會還涉及：

a. 區域的期望空間佈局，或

b. 氣味和氣味之間的異常關係。

第 9 條

當第 6 條提及的某一地區，不同於第 3 條或第 4 條所述的價值或其他偏遠地區，以及由於對鄰近市政府領土採取這種其他價值或距離效應而產生的影響，市議會只有在諮詢鄰近的市政府之後才這樣做。

第十條

通過我們的住房，空間規劃和環境部長的監管，與我們的農業，自然和食品質量部長達成協議，制定規則如何：

- a。 應確定第 3 條所述的氣味妨害;
- b。 第 3 條和第 4 條第 1 款中提及的距離是測量的。

Arrangement odor and livestock

Applicable from 31-03-2016 t / m 30-09-2016

Control of the State Secretary for Housing, Planning and the Environment of December 8, 2006, Nr. BWL/2006333382, Directorate General for Environmental Management, Soil, Water and Rural Development, Department of Agriculture, laying down geuremissiefactoren, minimumafstanden for fur animals, the method of conversion to odor nuisance and the method of distance (regulation odors and livestock)

Article 1

In these rules shall apply:

Annex: In this scheme associated Annex;

Law: Law odors and livestock ;

emission point: point where a relevant amount of odor outside:

- **a.**all covered animal shelter occurs, or will be; or
- **b.**the covered portion of the partially covered animal shelter occurs, it will be placed.

Article 2

- **1**The odor nuisance due to livestock is calculated taking into account the distribution model V-Stacks license in 2010.
- **2**The geometric mean of the emission points is considered as the point where the smell occurs or is brought out of the enclosure.
- **3**The fragrance load is determined in the nearest outer side of an odor-sensitive object, calculated from the geometric mean of the emission points.
- **4**If the animal is not covered, the odor is determined to the nearest exterior of an odor-sensitive object, starting from the point of the boundary which is closest to the corresponding odor-sensitive object.
- **5**The odor emissions from livestock farming is the sum of the different animal categories, held in the various animal enclosures, calculated numbers odor units per second per animal.
- **6**The number of odor units per second per animal an animal category, the number of animals in an animal category multiplied by the relevant animal category in Annex 1 odor emission factor included.
- **7**If no odor emission factor is laid down for a category of animal, the animal category in the calculation of the odor is disregarded.

Article 3

The distance referred to in Article 4, second paragraph, of the Act is set out in Annex 2 .

Article 4

- **1**The distance referred to in Articles 3, second and third paragraphs , and 4, first paragraph, of the Act shall be measured from the outside of the odor-sensitive object to the nearest emission point.
- **2**If the animal is not covered, the distance is measured from the exterior of an odor-sensitive object to the point of the boundary of the animal which is closest to the corresponding odor-sensitive object.

Article 5

This regulation comes into force on the date when the law enters into force.

Article 6

This regulation shall be cited as the odor and livestock.

This regulation will be published with the explanatory memorandum in the Government Gazette.

The Hague, December 8, 2006

The

State Secretary

of Housing, Spatial Planning and the Environment

PLBA van Geel

Annex 1 referred to in Article 2, paragraph (odor emission factors) of the Regulations odor and livestock

Rav code	Housing System by category	odor emission factor
KEY CATEGORY A: CATTLE		
A 1	animal category dairy cows older than 2 years	not determined
A 2	animal category suckler cows older than 2 years	not determined
A 3	animal category female calves up to 2 years	not determined
A 4	animal category calves to about 8 months	
-	emission and other housing	35.6
-	chemical air scrubbing system 30% odor reduction	24.9
-	biological air scrubbing system 45% odor reduction	19.6

Rav code	Housing System by category	odor emission factor
	(BWL 2004.01.V4; 2006.02.V3 BWL, BWL 2007.03.V5; 2008.01.V3 BWL, BWL 2008.02.V3; 2008.03.V3 BWL, BWL 2008.04.V3; 2008.05.V3 BWL, BWL 2008.12.V3; BWL 2009.13.V3 ; 2009.20.V2 BWL, BWL 2009.21.V2; 2010.27.V3 BWL, BWL 2010.28.V3; 2011.11.V2 BWL, BWL 2011.12.V2; 2013.02.V1 BWL, BWL 2015.04.V1)	
-	biological air scrubbing system 70% odor reduction (BWL 2012.07.V2)	10.7
-	air scrubbing system combined 70% odor reduction (BWL 2006.14.V4)	10.7
-	air scrubbing system combined 70% odor reduction (BWL 2006.14.V4)	10.7
-	air scrubbing system combined 75% odor reduction (BWL 2007.01.V5; 2007.02.V4 BWL, BWL 2010.02.V3; 2011.07.V2 BWL, BWL 2011.08.V2)	8.9
-	air scrubbing system combined 80% odor reduction (BWL 2006.15.V5)	7.1
-	air scrubbing system combined 85% odor reduction (BWL 2009.12.V2)	5.3
A 5	dilapidated	
A 6	animal category beef bulls and other cattle from approximately 8 to 24 months (red meat)	35.6
A 7	animal category bulls and other cattle over 2 years	not determined
KEY CATEGORY B: SHEEP		
B 1	animal category sheep older than one year, including lambs up to 45 kg ^{1,2}	7.8
KEY CATEGORY C: GOAT		
C 1	animal category goats over 1 year	18.8
C 2	category of animal rearing goats from 61 days to one year	11.3

Rav code	Housing System by category	odor emission factor
C 3	category of animal rearing goats and lambs for further fattening to 60 days	5.7
KEY CATEGORY D: PIGS ³		
D 1	breeding sows, including piglets to 25 kg	
D1.1	category of animal rearing piglets (weaned piglets)	
-	low-emission housing (ae ≤0,3 kg per pig place per year) ⁴	5.4
-	chemical air scrubbing system 30% odor reduction	3.8
-	biological air scrubbing system 45% odor reduction (BWL 2004.01.V4; 2006.02.V3 BWL, BWL 2007.03.V5; 2008.01.V3 BWL, BWL 2008.02.V3; 2008.03.V3 BWL, BWL 2008.04.V3; 2008.05.V3 BWL, BWL 2008.12.V3; BWL 2009.13 V3. ; 2009.20.V2 BWL, BWL 2009.21.V2; 2010.27.V3 BWL, BWL 2010.28.V3; 2011.11.V2 BWL, BWL 2011.12.V2; 2013.02.V1 BWL, BWL 2015.04.V1)	3.0
-	biological air scrubbing system 70% odor reduction (BWL 2012.07.V2)	1.6
-	air scrubbing system combined 70% odor reduction (BWL 2006.14.V4)	1.6
-	air scrubbing system combined 75% odor reduction (BWL 2007.01.V5; 2007.02.V4 BWL, BWL 2010.02.V3; 2011.07.V2 BWL, BWL 2011.08.V2)	1.4
-	air scrubbing system combined 80% odor reduction (BWL 2006.15.V5)	1.1
-	air scrubbing system combined 85% odor reduction (BWL 2009.12.V2)	0.8
-	other housing	7.8
-	chemical air scrubbing system 30% odor reduction	5.5
-	biological air scrubbing system 45% odor reduction (BWL 2004.01.V4; 2006.02.V3 BWL, BWL 2007.03.V5; 2008.01.V3 BWL, BWL 2008.02.V3; 2008.03.V3 BWL, BWL 2008.04.V3; 2008.05.V3 BWL, BWL 2008.12.V3; BWL 2009.13.V3 ; 2009.20.V2 BWL, BWL 2009.21.V2; 2010.27.V3 BWL, BWL 2010.28.V3; 2011.11.V2 BWL, BWL 2011.12.V2; 2013.02.V1 BWL, BWL 2015.04.V1)	4.3
-	biological air scrubbing system 70% odor reduction (BWL 2012.07.V2)	2.3
-	air scrubbing system combined 70% odor reduction (BWL 2006.14.V4)	2.3

Rav code	Housing System by category	odor emission factor
-	air scrubbing system combined 75% odor reduction (BWL 2007.01.V5; 2007.02.V4 BWL, BWL 2010.02.V3; 2011.07.V2 BWL, BWL 2011.08.V2)	2.0
-	air scrubbing system combined 80% odor reduction (BWL 2006.15.V5)	1.6
-	air scrubbing system combined 85% odor reduction (BWL 2009.12.V2)	1.2
D 1.2 animal category farrowing sows (incl. piglets until weaning)		
-	emission and other housing	27.9
-	chemical air scrubbing system 30% odor reduction	19.5
-	biological air scrubbing system 45% odor reduction (BWL 2004.01.V4; 2006.02.V3 BWL, BWL 2007.03.V5; 2008.01.V3 BWL, BWL 2008.02.V3; 2008.03.V3 BWL, BWL 2008.04.V3; 2008.05.V3 BWL, BWL 2008.12.V3; BWL 2009.13.V3 ; 2009.20.V2 BWL, BWL 2009.21.V2; 2010.27.V3 BWL, BWL 2010.28.V3; 2011.11.V2 BWL, BWL 2011.12.V2; 2013.02.V1 BWL, BWL 2015.04.V1)	15.3
-	biological air scrubbing system 70% odor reduction (BWL 2012.07.V2)	8.4
-	air scrubbing system combined 70% odor reduction (BWL 2006.14.V4)	8.4
-	air scrubbing system combined 75% odor reduction (BWL 2007.01.V5; 2007.02.V4 BWL, BWL 2010.02.V3; 2011.07.V2 BWL, BWL 2011.08.V2)	7.0
-	air scrubbing system combined 80% odor reduction (BWL 2006.15.V5)	5.6
-	air scrubbing system combined 85% odor reduction (BWL 2009.12.V2)	4.2
D1.3 category of animal mating and gestating sows		
-	emission and other housing	18.7
-	chemical air scrubbing system 30% odor reduction	13.1
-	biological air scrubbing system 45% odor reduction (BWL 2004.01.V4; 2006.02.V3 BWL, BWL 2007.03.V5; 2008.01.V3 BWL, BWL 2008.02.V3; 2008.03.V3 BWL, BWL 2008.04.V3; 2008.05.V3 BWL, BWL 2008.12.V3; BWL 2009.13.V3 ; 2009.20.V2 BWL, BWL 2009.21.V2; 2010.27.V3 BWL, BWL 2010.28.V3; 2011.11.V2 BWL, BWL 2011.12.V2; 2013.02.V1 BWL, BWL 2015.04.V1)	10.3
-	biological air scrubbing system 70% odor reduction (BWL 2012.07.V2)	5.6
-	air scrubbing system combined 70% odor reduction (BWL 2006.14.V4)	5.6

Rav code	Housing System by category	odor emission factor
-	air scrubbing system combined 75% odor reduction (BWL 2007.01.V5; 2007.02.V4 BWL, BWL 2010.02.V3; 2011.07.V2 BWL, BWL 2011.08.V2)	4.7
-	air scrubbing system combined 80% odor reduction (BWL 2006.15.V5)	3.7
-	air scrubbing system combined 85% odor reduction (BWL 2009.12.V2)	2.8
D 2	category of animal breeding boars, 7 months and older	
-	emission and other housing	18.7
-	chemical air scrubbing system 30% odor reduction	13.1
-	biological air scrubbing system 45% odor reduction (BWL 2004.01.V4; 2006.02.V3 BWL, BWL 2007.03.V5; 2008.01.V3 BWL, BWL 2008.02.V3; 2008.03.V3 BWL, BWL 2008.04.V3; 2008.05.V3 BWL, BWL 2008.12.V3; BWL 2009.13.V3 ; 2009.20.V2 BWL, BWL 2009.21.V2; 2010.27.V3 BWL, BWL 2010.28.V3; 2011.11.V2 BWL, BWL 2011.12.V2; 2013.02.V1 BWL, BWL 2015.04.V1)	10.3
-	biological air scrubbing system 70% odor reduction (BWL 2012.07.V2)	5.6
-	air scrubbing system combined 70% odor reduction (BWL 2006.14.V4)	5.6
-	air scrubbing system combined 75% odor reduction (BWL 2007.01.V5; 2007.02.V4 BWL, BWL 2010.02.V3; 2011.07.V2 BWL, BWL 2011.08.V2)	4.7
-	air scrubbing system combined 80% odor reduction (BWL 2006.15.V5)	3.7
-	air scrubbing system combined 85% odor reduction BWL 2009.12.V2	2.8
D 3	animal category pigs, breeding boars of about 25 kg to 7 months, breeding sows of about 25 kg to first cover ⁵	
-	emission and other housing (ae ≤1,6 kg kg per animal per year) ⁴	17.9
-	chemical air scrubbing system 30% odor reduction	12.5
-	biological air scrubbing system 45% odor reduction (BWL 2004.01.V4; 2006.02.V3 BWL, BWL 2007.03.V5; 2008.01.V3 BWL, BWL 2008.02.V3; 2008.03.V3 BWL, BWL 2008.04.V3; 2008.05.V3 BWL, BWL 2008.12.V3; BWL 2009.13.V3 ; 2009.20.V2 BWL, BWL 2009.21.V2; 2010.27.V3 BWL, BWL 2010.28.V3; 2011.11.V2 BWL, BWL 2011.12.V2; 2013.02.V1 BWL, BWL 2015.04.V1)	9.8
-	biological air scrubbing system 70% odor reduction (BWL 2012.07.V2)	5.4
-	air scrubbing system combined 70% odor reduction (BWL 2006.14.V4)	5.4

Rav code	Housing System by category	odor emission factor
-	air scrubbing system combined 75% odor reduction (BWL 2007.01.V5; 2007.02.V4 BWL, BWL 2010.02.V3; 2011.07.V2 BWL, BWL 2011.08.V2)	4.5
-	air scrubbing system combined 80% odor reduction (BWL 2006.15.V5)	3.6
-	air scrubbing system combined 85% odor reduction (BWL 2009.12.V2)	2.7
-	other housing	23.0
-	chemical air scrubbing system 30% odor reduction	16.1
-	biological air scrubbing system 45% odor reduction (BWL 2004.01.V4; 2006.02.V3 BWL, BWL 2007.03.V5; 2008.01.V3 BWL, BWL 2008.02.V3; 2008.03.V3 BWL, BWL 2008.04.V3; 2008.05.V3 BWL, BWL 2008.12.V3; BWL 2009.13.V3 ; 2009.20.V2 BWL, BWL 2009.21.V2; 2010.27.V3 BWL, BWL 2010.28.V3; 2011.11.V2 BWL, BWL 2011.12.V2; 2013.02.V1 BWL, BWL 2015.04.V1)	12.7
-	biological air scrubbing system 70% odor reduction (BWL 2012.07.V2)	6.9
-	air scrubbing system combined 70% odor reduction (BWL 2006.14.V4)	6.9
-	air scrubbing system combined 75% odor reduction (BWL 2007.01.V5; 2007.02.V4 BWL, BWL 2010.02.V3; 2011.07.V2 BWL, BWL 2011.08.V2)	5.8
-	air scrubbing system combined 80% odor reduction (BWL 2006.15.V5)	4.6
-	air scrubbing system combined 85% odor reduction (BWL 2009.12.V2)	3.5
KEY CATEGORY E: CHICKENS		
E 1	category of animal rearing hens and cocks of laying breeds; less than 18 weeks	
-	battery housing	
-	emission and other housing	0.18
-	chemical air scrubbing system 30% odor reduction	0.13
-	chemical air scrubbing system 40% odor reduction (BWL 2007.05.V5)	0.11
-	biological air scrubbing system 45% odor reduction	0.10
-	biofilter 45% odor reduction	0.10
-	non-battery housing	
-	emission and other housing	0.18

Rav code	Housing System by category	odor emission factor
-	chemical air scrubbing system 30% odor reduction	0.13
-	chemical air scrubbing system 40% odor reduction (BWL 2007.05.V5)	0.11
-	biological air scrubbing system 45% odor reduction	0.10
-	biofilter 45% odor reduction	0.10
E 2	animal category and laying hens (grand) parent animals of laying breeds	
-	battery housing	
-	manure storage battery under emission and other housing	0.69
-	emission and other housing	0.35
-	chemical air scrubbing system 30% odor reduction	0.25
-	chemical air scrubbing system 40% odor reduction (BWL 2007.05.V5)	0.21
-	biological air scrubbing system 45% odor reduction	0.19
-	biofilter 45% odor reduction	0.19
-	non-battery housing	
-	emission and other housing	0.34
-	chemical air scrubbing system 30% odor reduction	0.24
-	chemical air scrubbing system 40% odor reduction (BWL 2007.05.V5)	0.20
-	biological air scrubbing system 45% odor reduction	0.19
-	biofilter 45% odor reduction	0.19
E 3	animal category (grand) parents in rearing of chickens; younger than 19 weeks	
-	emission and other housing	0.18
-	chemical air scrubbing system 30% odor reduction	0.13
-	chemical air scrubbing system 40% odor reduction (BWL 2007.05.V5)	0.11
-	biological air scrubbing system 45% odor reduction	0.10
-	biofilter 45% odor reduction	0.10
E 4	animal category (grand) parent animals of broilers	
-	emission and other housing	0.93

Rav code	Housing System by category	odor emission factor
-	chemical air scrubbing system 30% odor reduction	0.65
-	chemical air scrubbing system 40% odor reduction (BWL 2007.05.V5)	0.56
-	biological air scrubbing system 45% odor reduction	0.51
-	biofilter 45% odor reduction	0.51
E 5	animal category chickens	
	emission and other housing	0.24
-	hatching and rearing to 13 days and continued housing	0.22
-	hatching and rearing to 19 days and continued housing	0.19
-	chemical air scrubbing system 30% odor reduction	0.17
-	chemical air scrubbing system 40% odor reduction (BWL 2007.05.V5)	0.14
-	biological air scrubbing system 45% odor reduction	0.13
-	biofilter 45% odor reduction	0.13
	KEY CATEGORY F: TURKEYS	
F 1	animal category parent of turkey meat in rearing; up to 6 weeks	
-	emission and other housing	0.29
-	chemical air scrubbing system 30% odor reduction	0.20
-	chemical air scrubbing system 40% odor reduction (BWL 2007.05.V5)	0.17
-	biological air scrubbing system 45% odor reduction	0.16
-	biofilter 45% odor reduction	0.16
F 2	animal category parent of turkey meat in rearing; from 6 to 30 weeks	
-	emission and other housing	1.55
-	chemical air scrubbing system 30% odor reduction	1.09
-	chemical air scrubbing system 40% odor reduction (BWL 2007.05.V5)	0.93
-	biological air scrubbing system 45% odor reduction	0.85
-	biofilter 45% odor reduction	0.85

Rav code	Housing System by category	odor emission factor
F 3	animal category parent of meat turkeys from 30 weeks of age	
-	emission and other housing	1.55
-	chemical air scrubbing system 30% odor reduction	1.09
-	chemical air scrubbing system 40% odor reduction (BWL 2007.05.V5)	0.93
-	biological air scrubbing system 45% odor reduction	0.85
-	biofilter 45% odor reduction	0.85
F 4	animal category fattening turkeys	
-	emission and other housing	1.55
-	chemical air scrubbing system 30% odor reduction	1.09
-	chemical air scrubbing system 40% odor reduction (BWL 2007.05.V5)	0.93
-	biological air scrubbing system 45% odor reduction	0.85
-	biofilter 45% odor reduction	0.85
KEY CATEGORY G: DUCKS		
G 1	animal category parent meat ducks to 24 months	
-	emission and other housing	0.49
-	chemical air scrubbing system 30% odor reduction	0.34
-	chemical air scrubbing system 40% odor reduction (BWL 2007.05.V5)	0.29
-	biological air scrubbing system 45% odor reduction	0.27
-	biofilter 45% odor reduction	0.27
G 2	animal category Meat ducks	
-	emission and other housing	0.49
-	chemical air scrubbing system 30% odor reduction	0.34
-	chemical air scrubbing system 40% odor reduction (BWL 2007.05.V5)	0.29
-	biological air scrubbing system 45% odor reduction	0.27
-	biofilter 45% odor reduction	0.27
KEY CATEGORY J: GUINEA FOWL		

Rav code	Housing System by category	odor emission factor
J 1	animal category guinea fowl for meat	
-	emission and other housing	0.24
-	chemical air scrubbing system 30% odor reduction	0.17
-	chemical air scrubbing system 40% odor reduction (BWL 2007.05.V5)	0.14
-	biological air scrubbing system 45% odor reduction	0.13
-	biofilter 45% odor reduction	0.13
KEY CATEGORY M: OTHERS		
M 1	Farm animals kept in farms	not determined

Endnotes:

- 1 The odor emission refers to a stable period of up to three months in the winter.
- 2 The odor emission factor means including breeding, rearing so that it does not count for the calculation of odor emissions.
- 3 A housing system with flushing gutters is not rated as a low-emission housing but other housing.
- 4 ae stands for ammonia.
- 5, the odor emission factor for breeding sows is used for breeding sows after the first mating.

Annex 2 referred to in Article 3 (distances fur) of the Regulations odor and livestock

The distances, measured in meters, for mink are determined as follows.

fur						
Rav-No.	animal Category	Number of breeding females				
H 1	mink	1-1000	1001-1500	1501-3000	3001-6000	6001-9000
Odor-sensitive object within built-up areas		175	200	225	250	275
Odor-sensitive object in the village		100	125	150	175	200

- **1.**The calculation boy and males ignored.
- **2.**If more than 9,000 breeding bitches are kept, the distance for each additional 3,000 breeding females is increased by 25 meters.

- **3.** If the fur-bearing animals are kept in low-emission housing, wherein the ammonia emission is less than or equal to 0.25 kg per animal per year, instead, the distances from the second row of the table ("outside built-up areas ") are reduced in size by 25 meter .
- **4.** If the odor-sensitive object is part of a different breeding, or on or after March 19, 2000 has ceased to be part of another livestock farming, to which the distance is odor-sensitive object:
 - **a.** at least 100 meters if the odor-sensitive object within the urban area is located, and
 - **b.** at least 50 meters if the odor-sensitive object outside of the village is situated.



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- Rosanne Vos
- Innovation manager

“Inspire by realization”



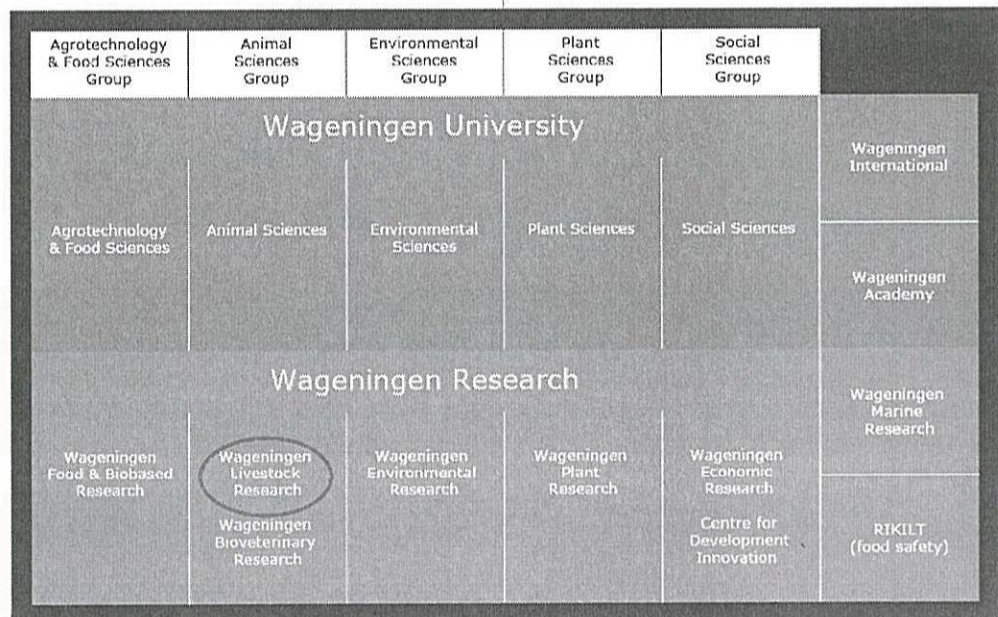
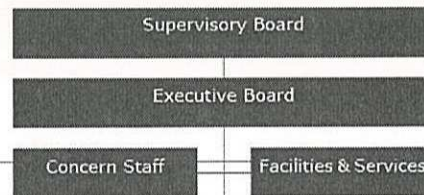
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Swine Innovation Centre (SIC) Sterksel

- Part of Wageningen University and Research
- Centre for pig farming now and in the future:
 - Innovation
 - Validation
 - Spread knowledge

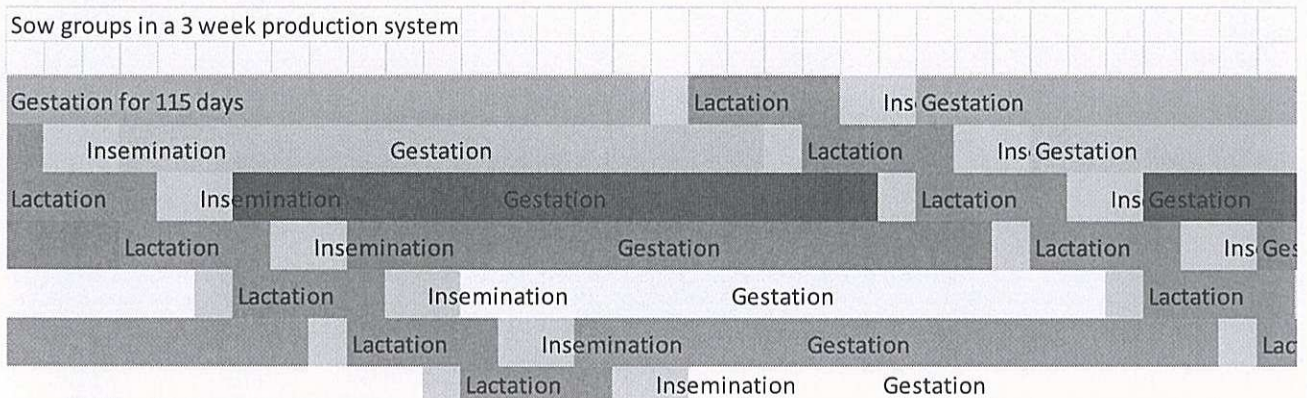


Organisation Wageningen UR



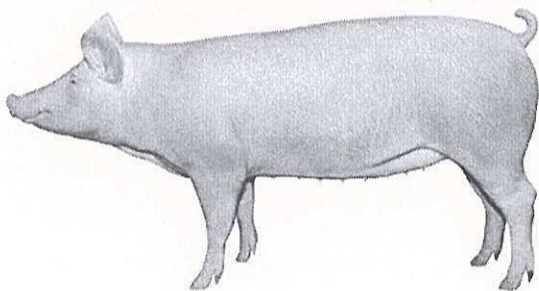
Company details

- 385 sows, 2400 fattening places (excl. rental stables)
- 3 week production system

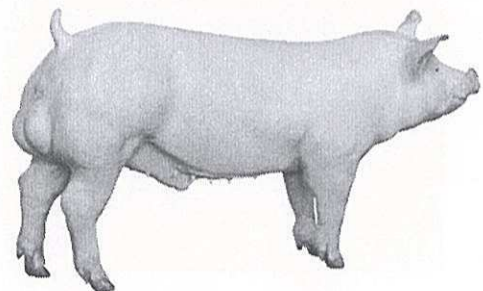


Company details

Topigs 20



Tempo

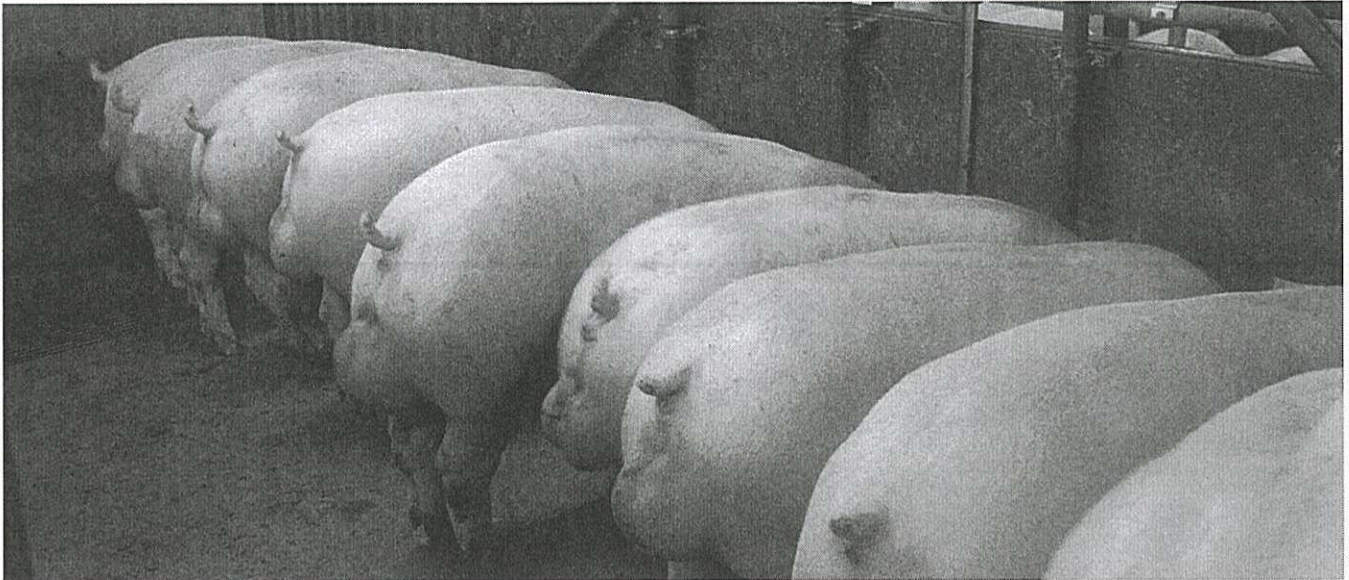


X



Company details

- No castration (producing for quality label; 1 Good Farming Star, Vion)



Company details

- Wean at 4 weeks
- Mainly dry pelleted feed (depending on research)
- Electronic eartags (RFID)



- Biogas installation



Data registration SIC

- Registration of weight per animal at birth, weaning, start and end fattening phase
- Registration of feed per feeder
- Medical treatment, diarrhea and animal scores and other observation on individual animals or as a group
- Supported by the veterinarian of 'De varkenspraktijk' (every three weeks a visit)



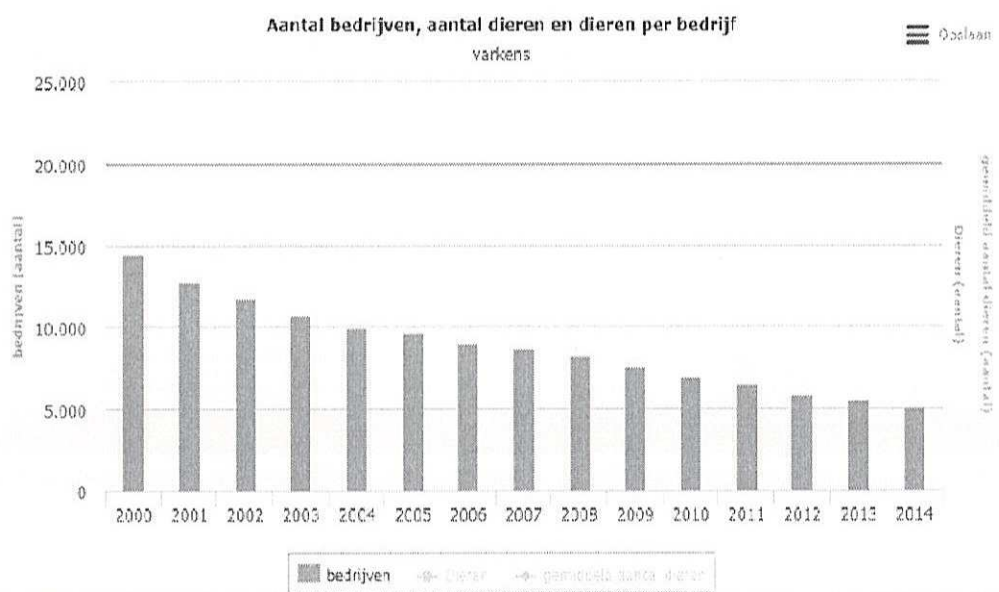
Technical results SIC Sterksel

	2015	~2016
Piglets per litter live born	15.5	16
Weaned per litter	13	13.5
Weaned per sow per year	30	31.7
Returners	15%	10%
ADG weaners (g/day, between 7,5-25 kg LW)	450	450
ADG finishers (g/day, between 25-120 kg LW)	900	900
FC finishers	2.50	2.50

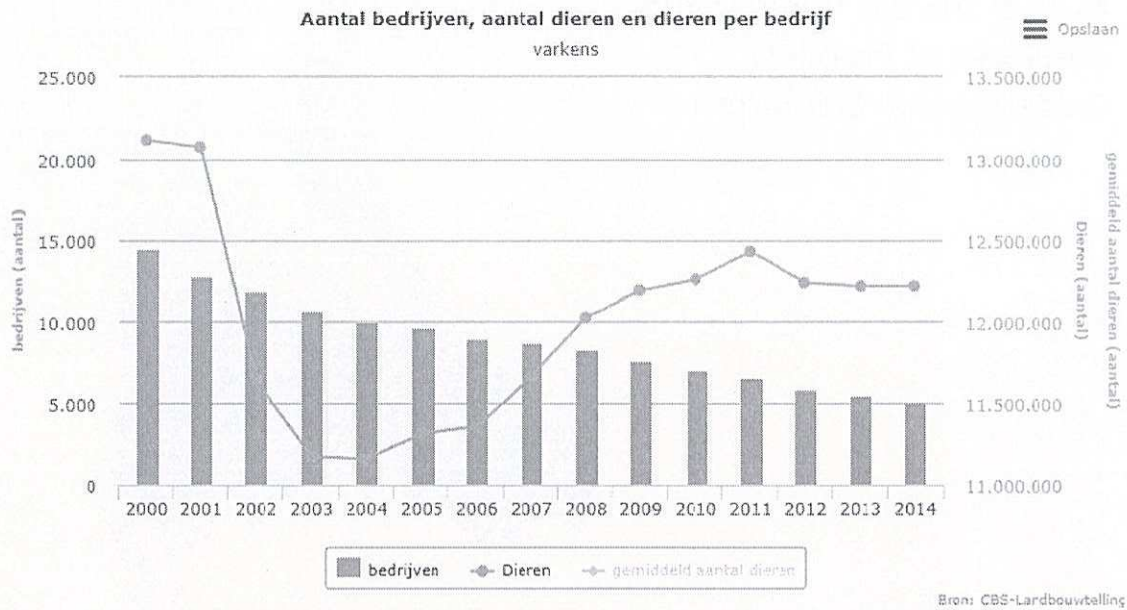


Pig farming in the Netherlands

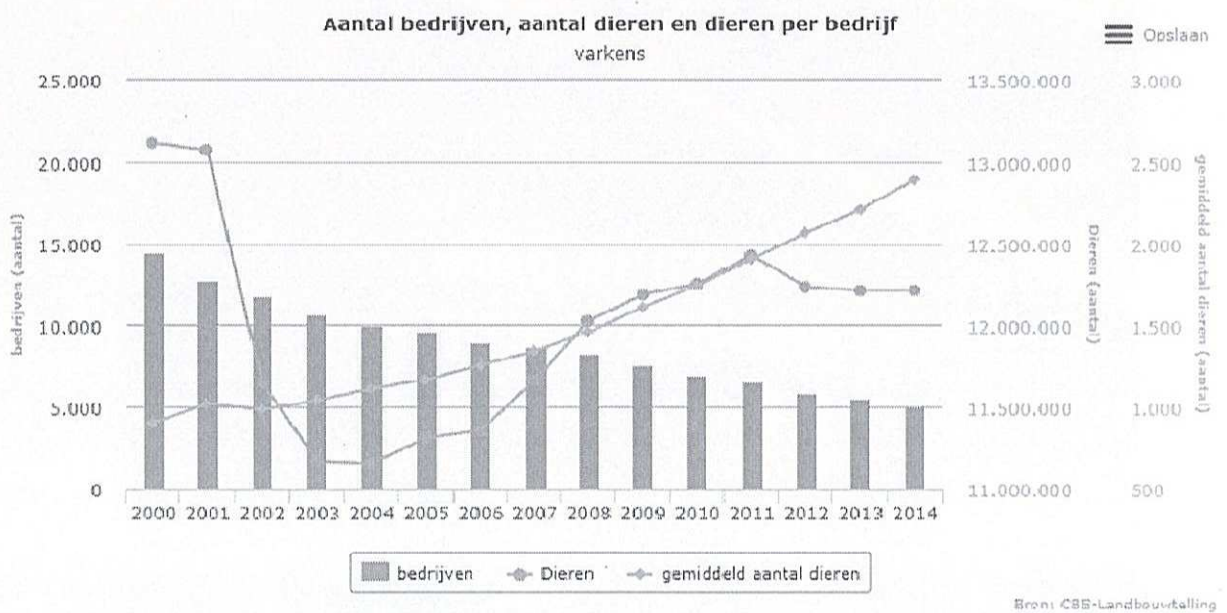
Dutch swine sector



Dutch swine sector



Dutch swine sector

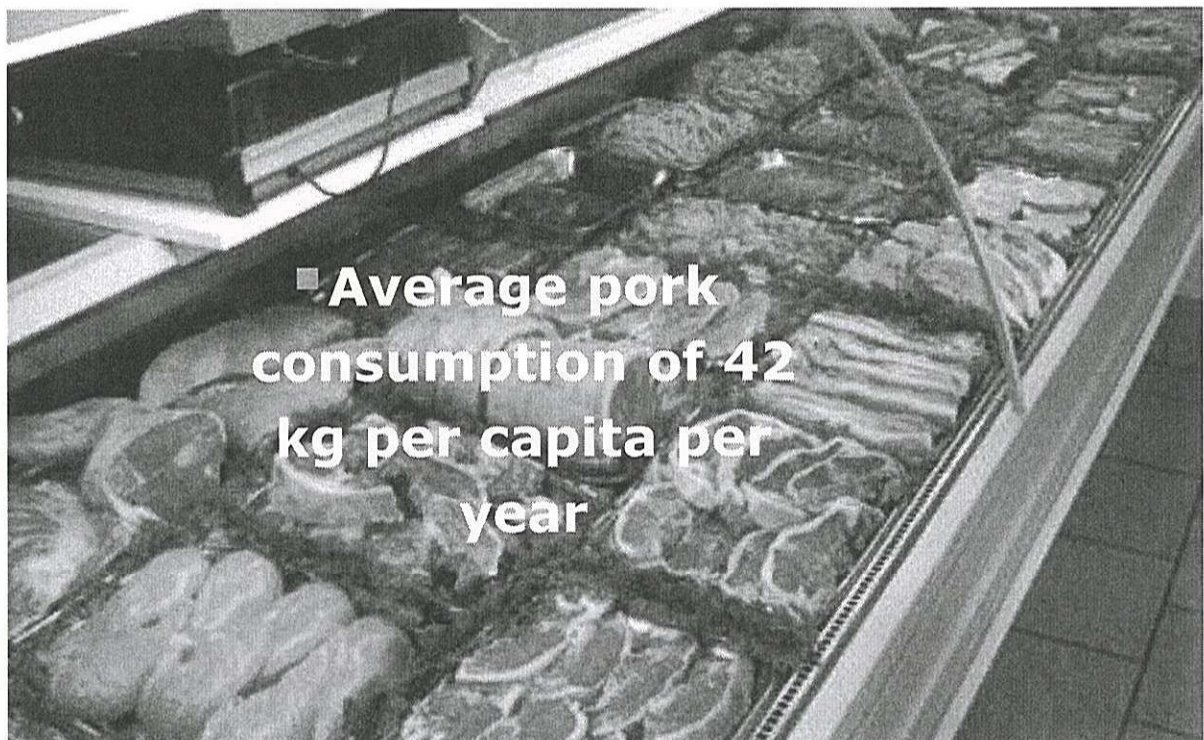


The pig sector

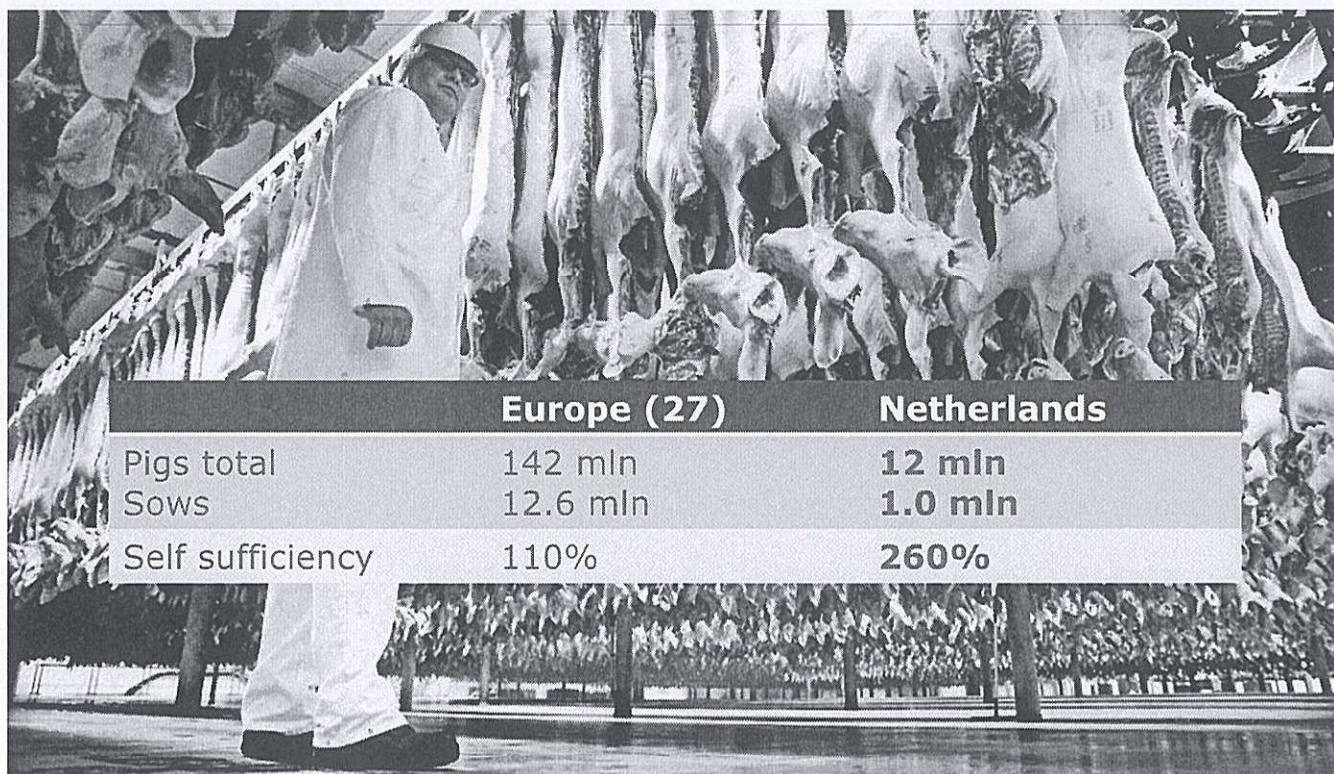
- Most of the pig farms in the provinces of Brabant, Gelderland en Limburg



The pig sector



The pig sector



	Europe (27)	Netherlands
Pigs total	142 mln	12 mln
Sows	12.6 mln	1.0 mln
Self sufficiency	110%	260%



Economics (excl labour costs)

- Sows (per average present sow per year)
 - Output (piglets and slaughter sows) 1223*
 - Costs 922
 - Margin 301
- Finishers (per average present finisher per year)
 - Output (finishers) 128.9*
 - Costs 108.9
 - Margin (per delivered pig) 20**

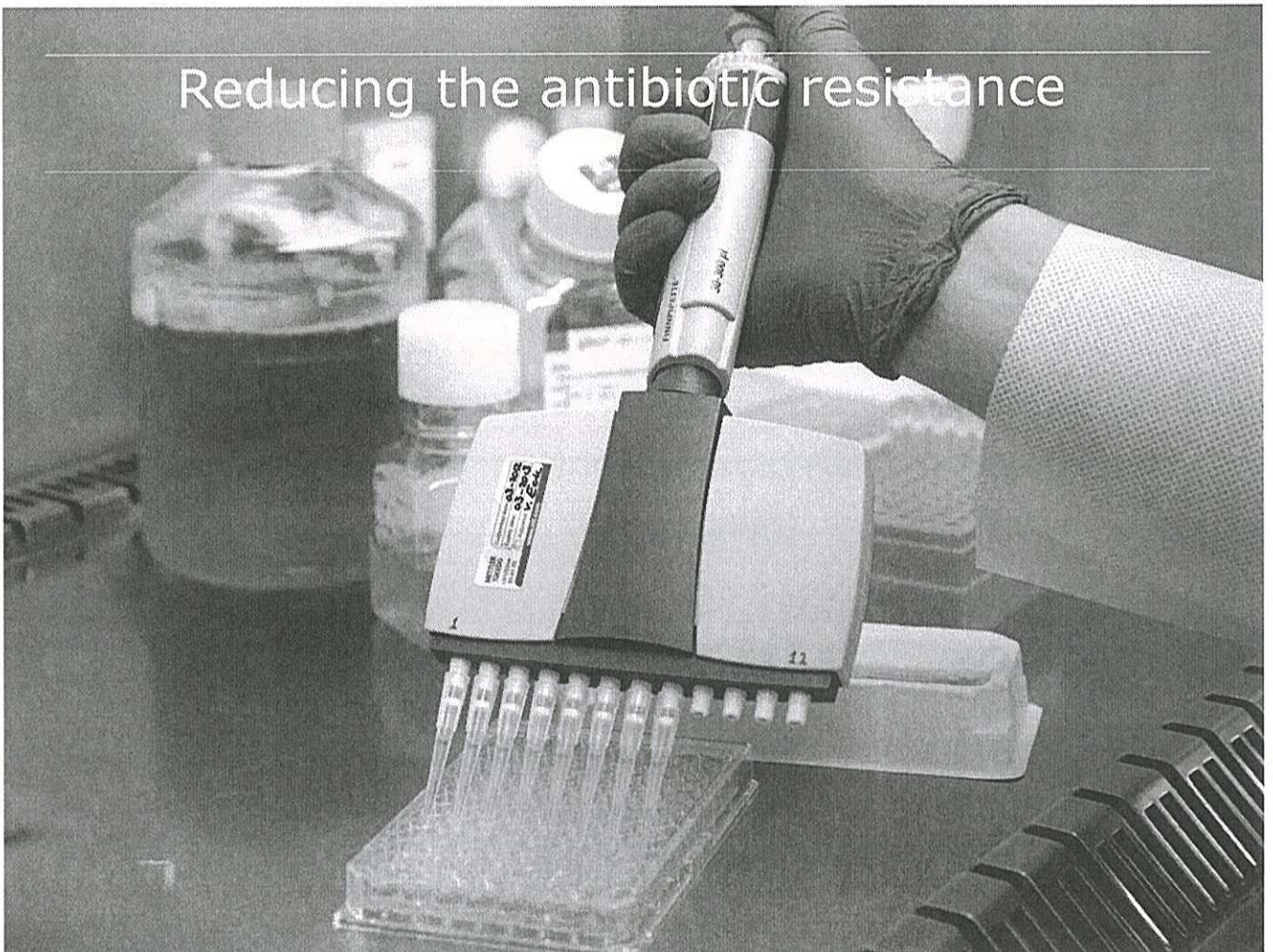
*2015: 10% lower output

**Year round x 3.1

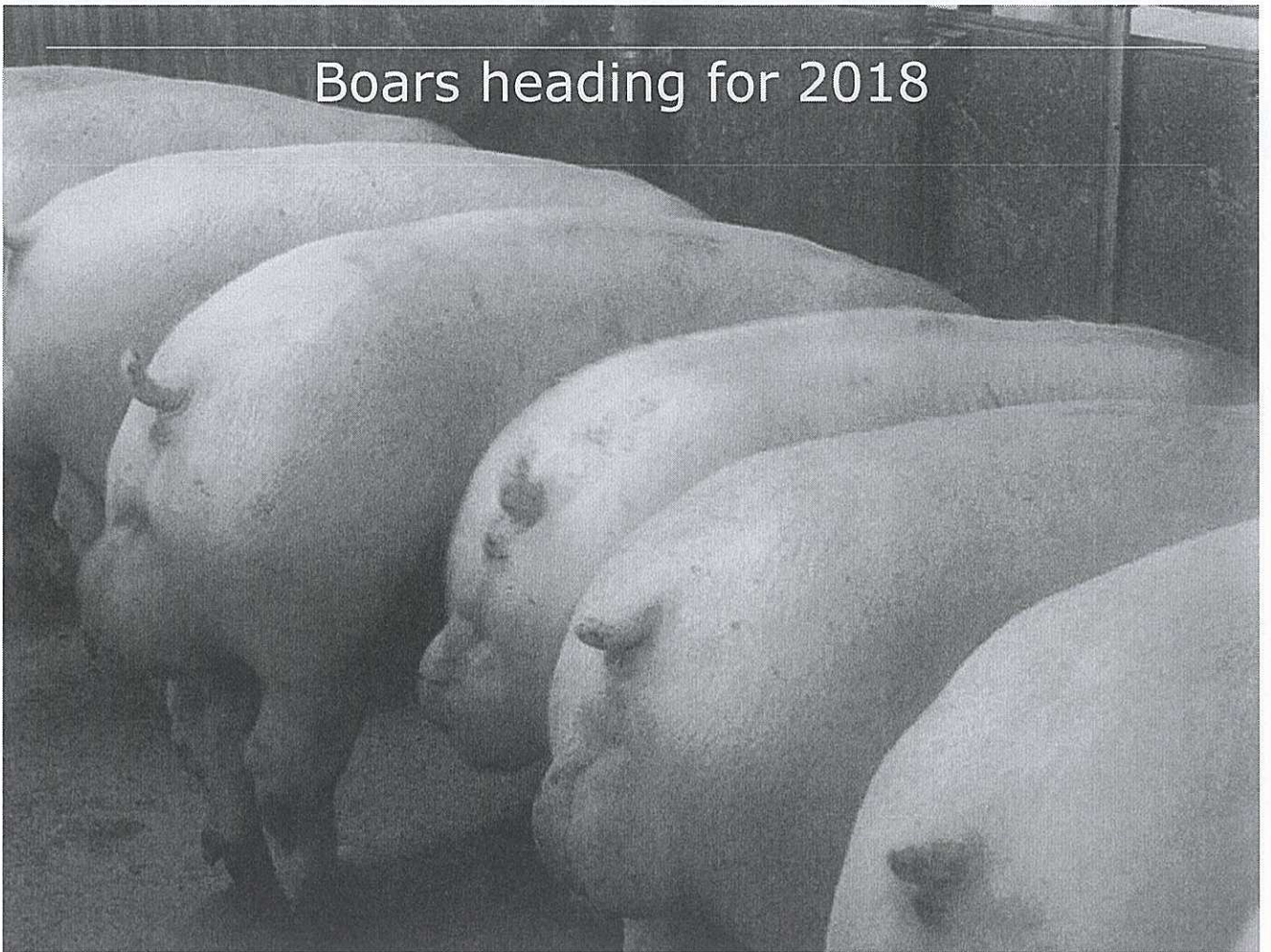
Trending Topics



Reducing the antibiotic resistance



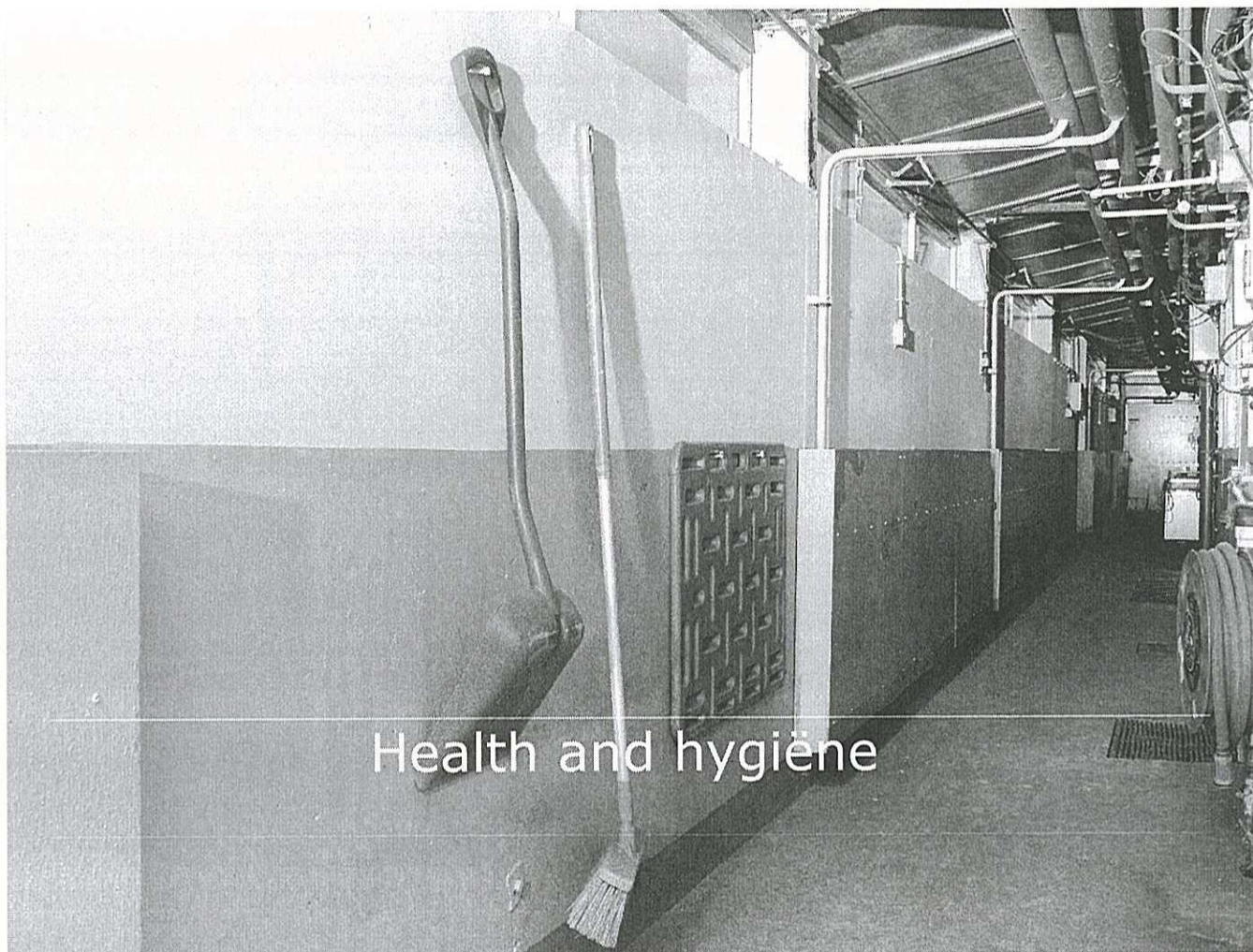
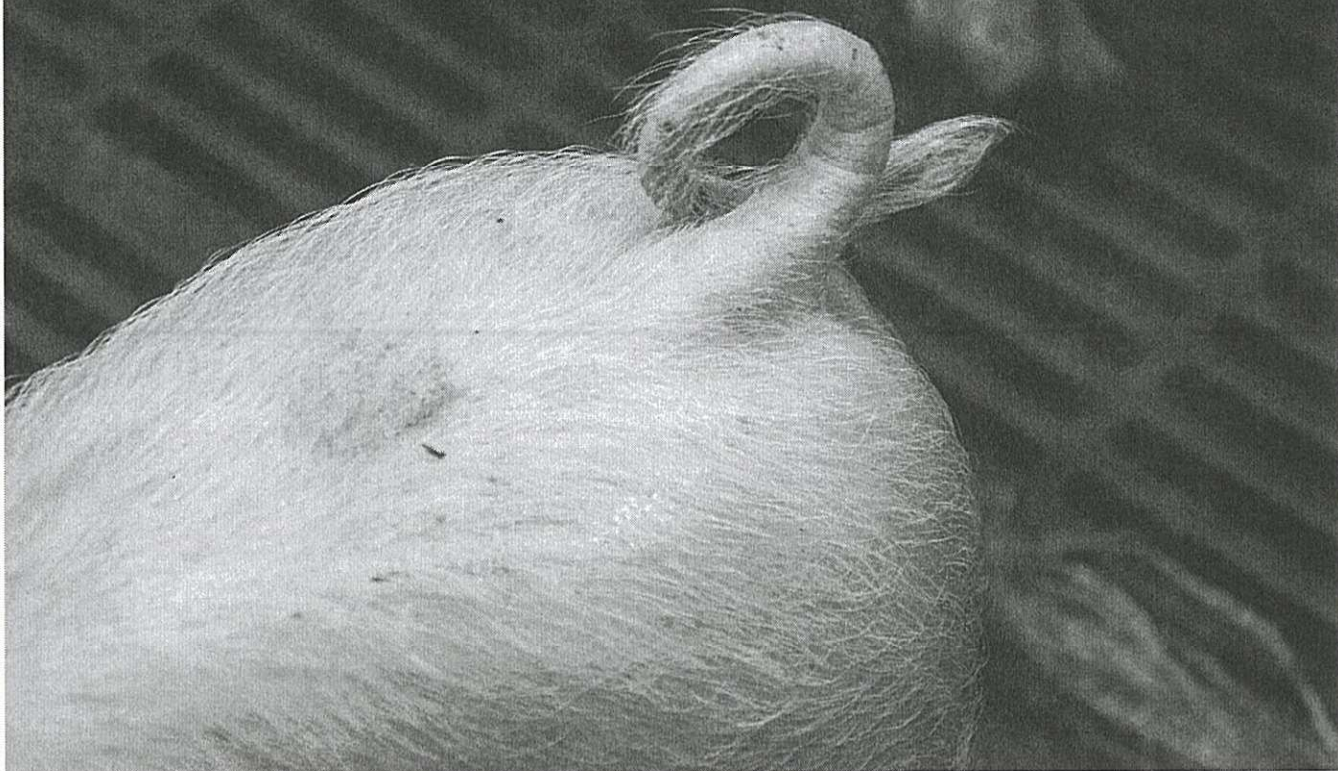
Boars heading for 2018



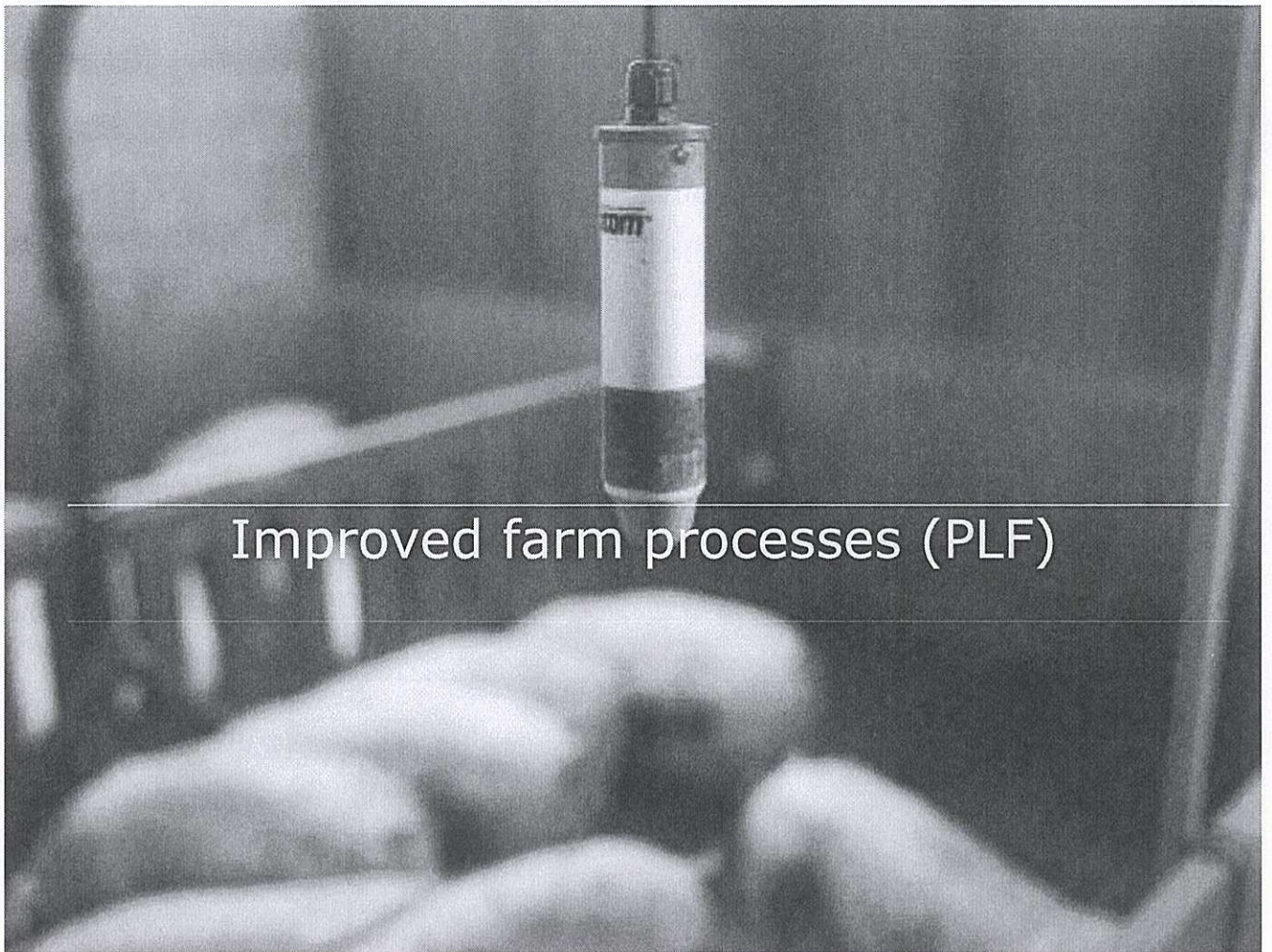
Group housing sows after 4 days of insemination



A tail too long for a tail too short?



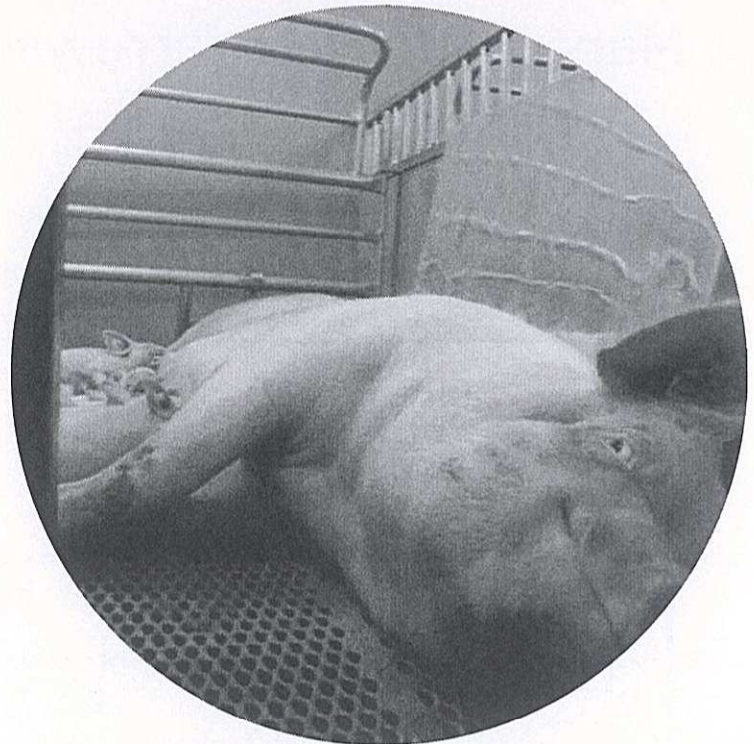
Health and hygiene



Improved farm processes (PLF)

Housing
systems...

...for sows in
farrowing units

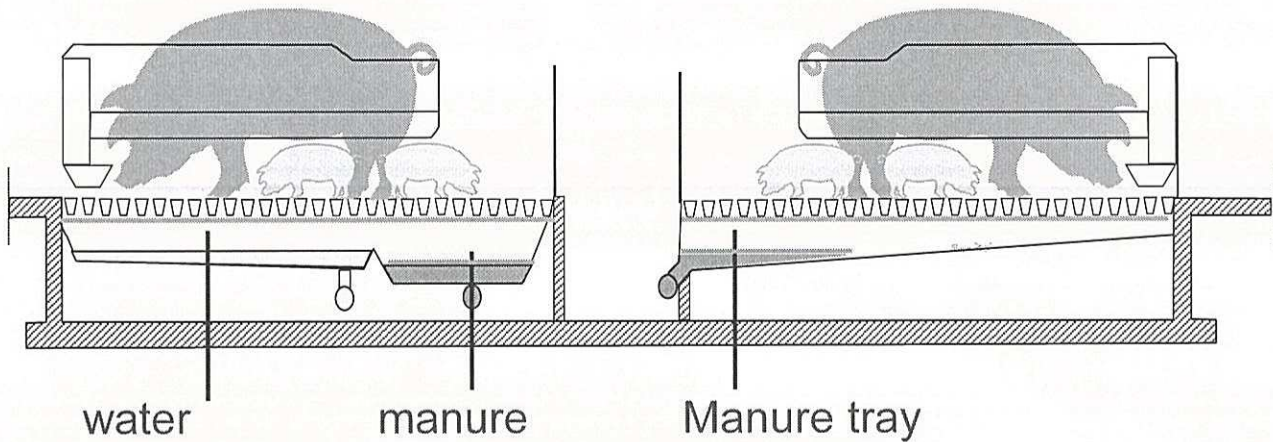


Manure tray farrowing sows

- Emitting surface without manure tray
- Emitting surface with manure tray

Separate water and manure area

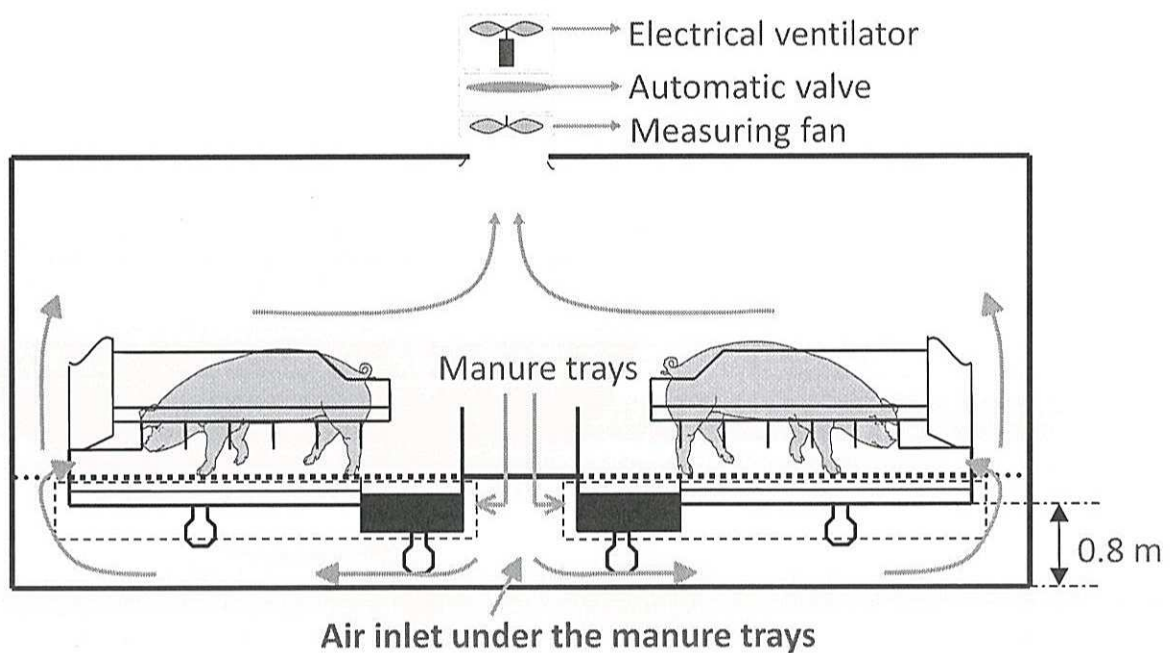
Combined water and manure area



Emission 8,3 to 2,9 kg NH₃/sow place/year



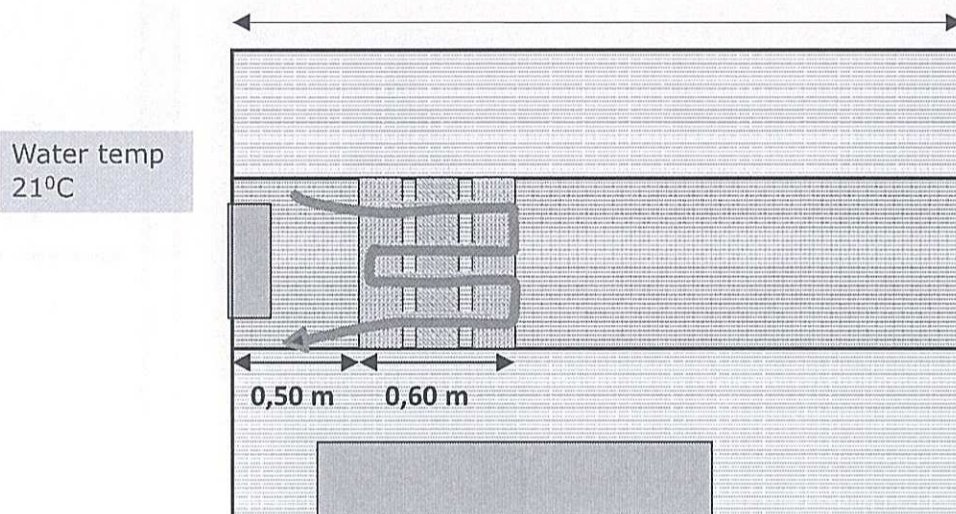
Manure-tray for farrowing sows



Manure-tray

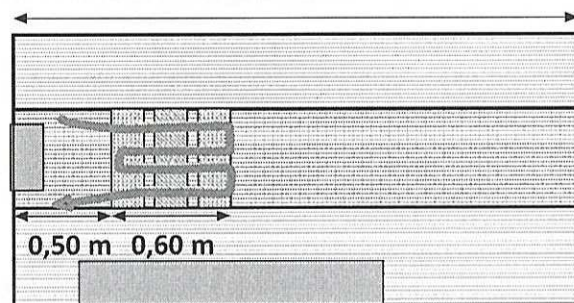


Floor cooling of the sow: 'Cool-sow' system

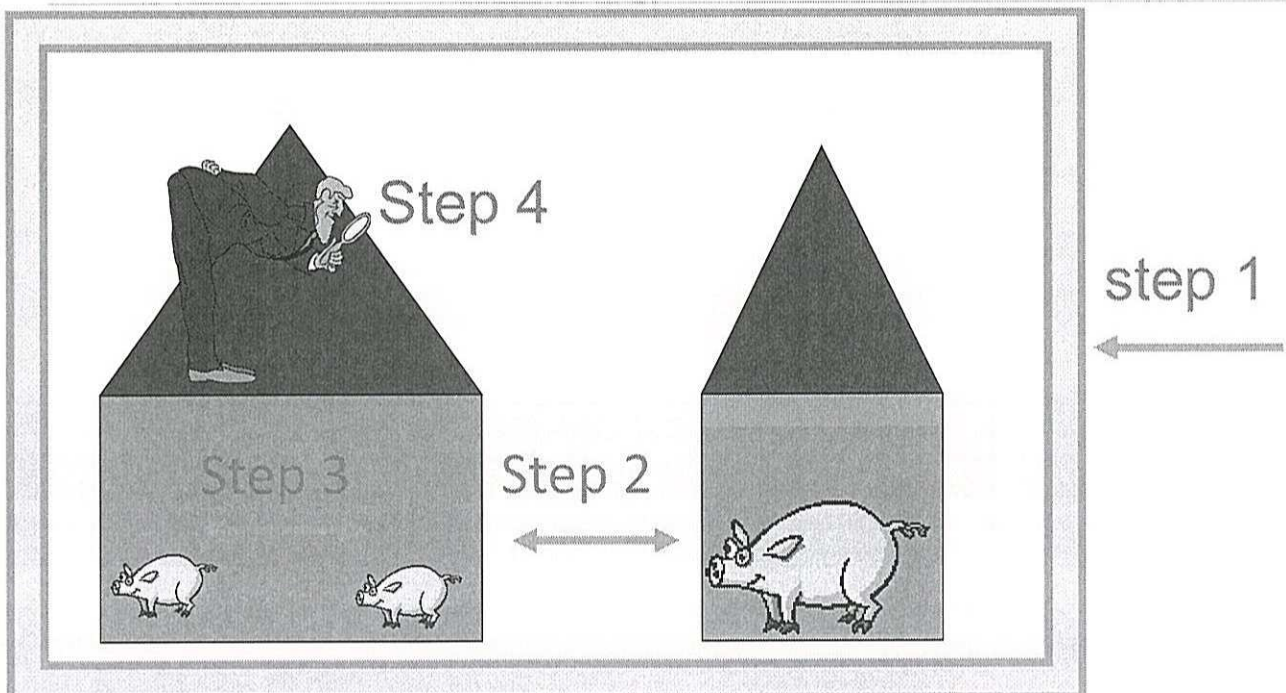


Results of floor cooling

- Feed intake sow +0.3 kg per day (no effect seasons)
- Average weaning weight piglets +0.4 kg (seasons)
- Also better results after weaning
- Next litter +1.0 live born piglet



Animal health

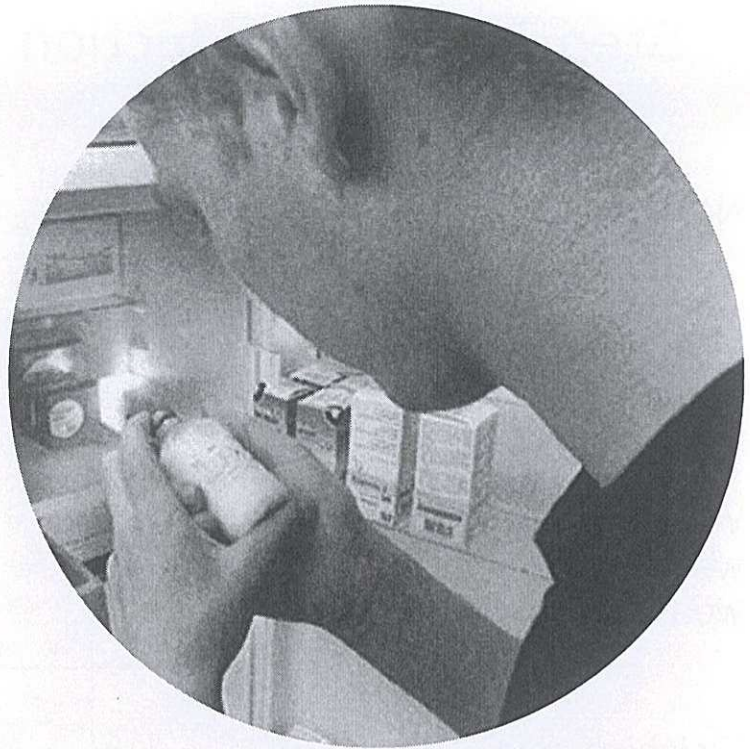


Improving animal health

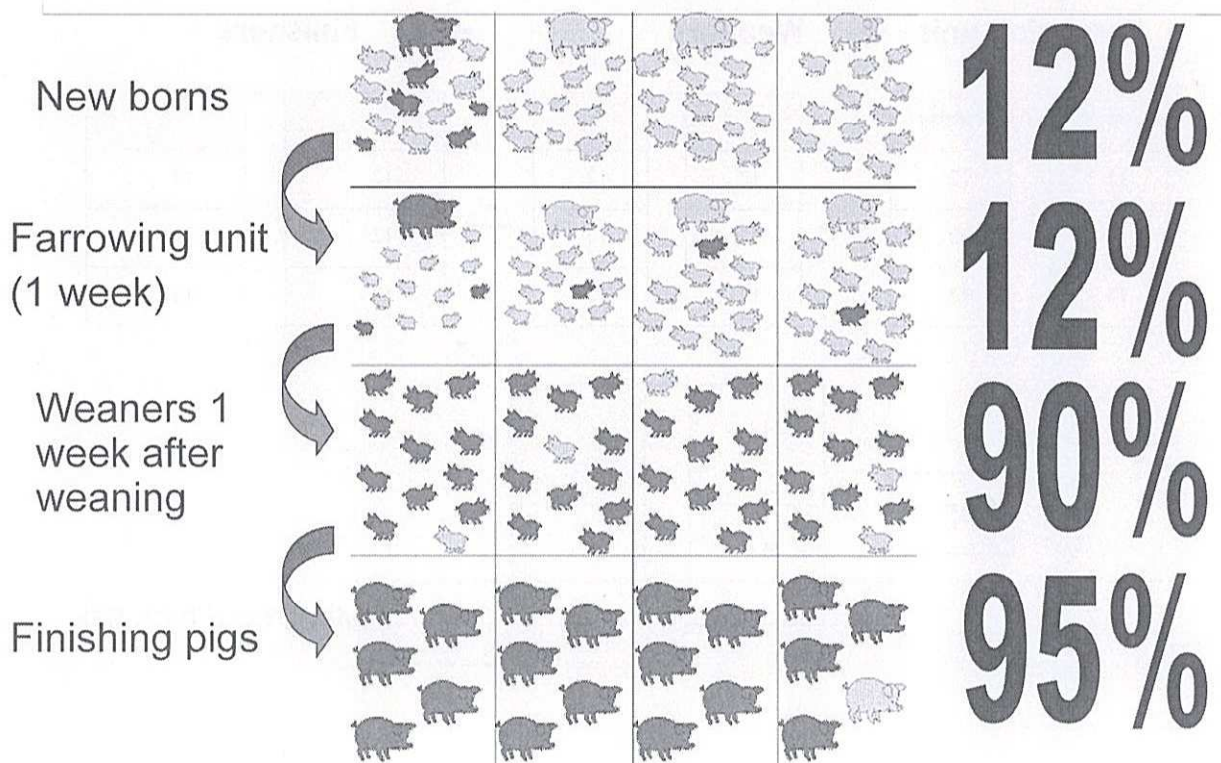
Why a trial?

Lungproblems 30-50% in farms

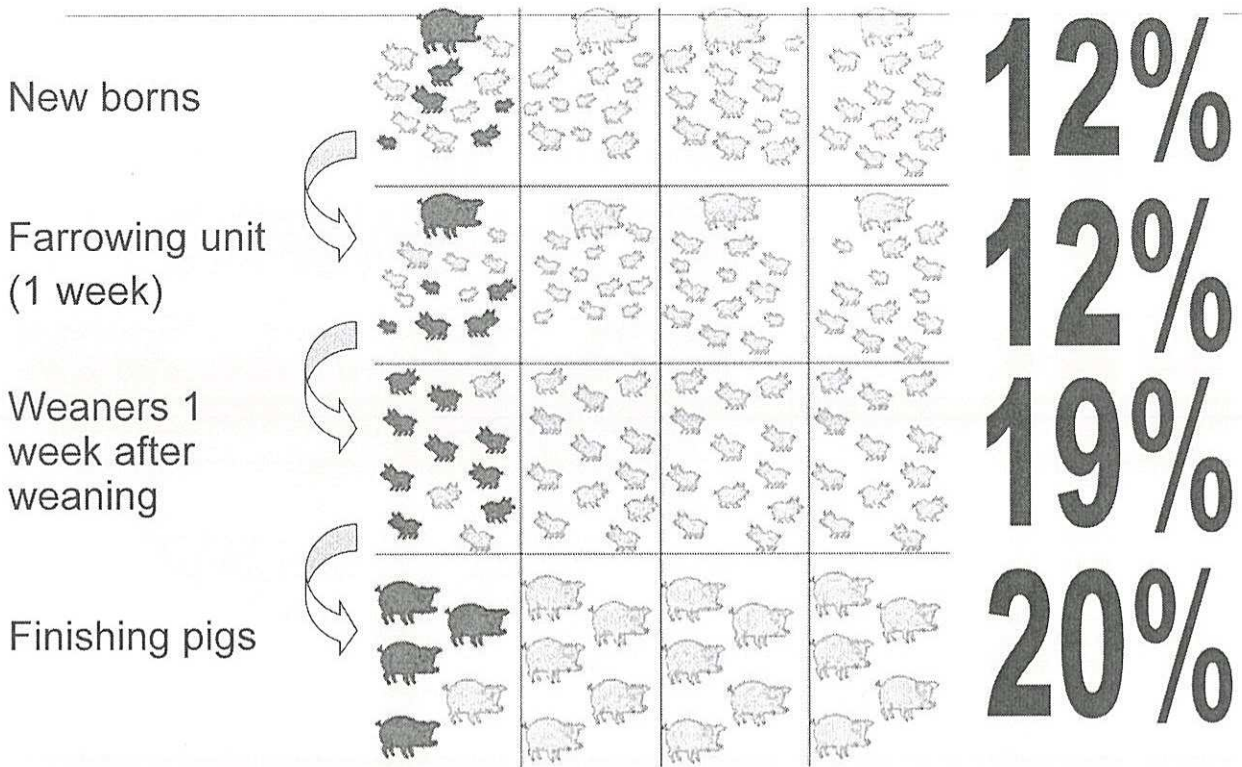
(Pleurisy -Pneumonial adhesions)



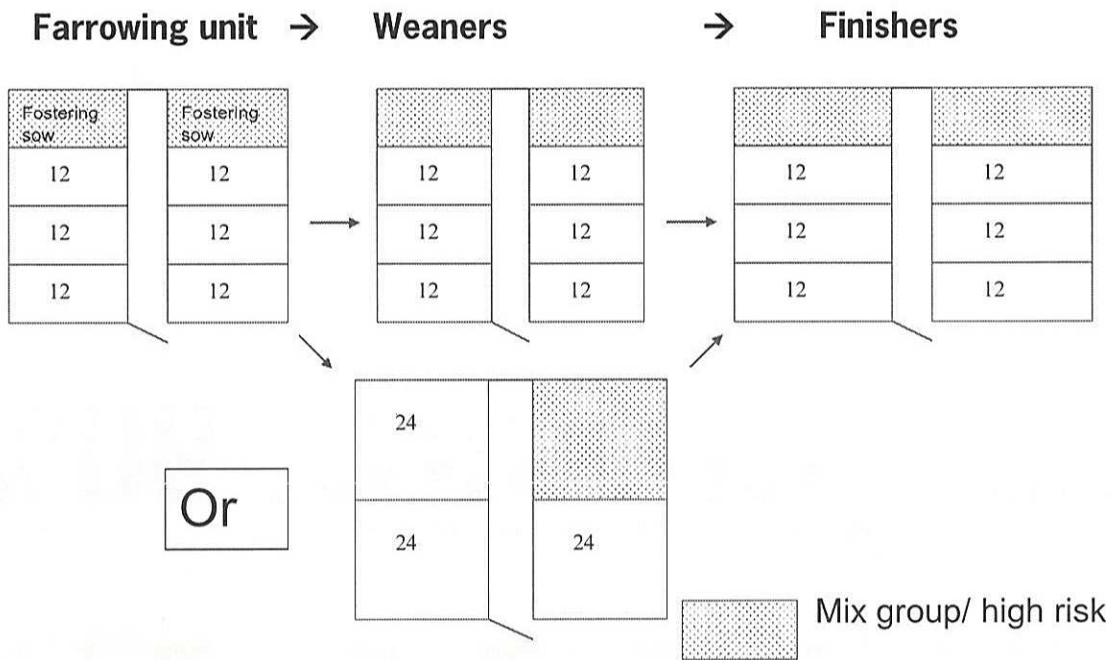
Step 3 (Effect of mixing pigs)



Step 3 (effect reduction of mixing)



Is the situation perfect....?



Improvements SIC Sterksel

Weaners (8 - 23 kg)	Less Mixing	Mixing
% Mortality	2	4
Growth (gr/day)	>450	380
Finishing		
Growth (gr/day)	810	758
Veterinary treatments	<15	>25
% Mortality	0,8	2,3
% pleurisies	5	30

- No treatments per groups (water or feed)
- No use of growth promoters



Let have a look in the stables!

- Showers
 - 6 showers with 3 compartments
 - undress
 - take the shower (press button)
 - take clothes and towel from farm
 - Remember number of the shower
 - Open door from every compartment

1
undress

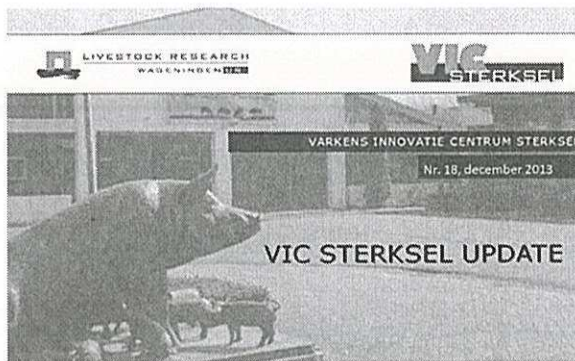
2
shower


3
company clothes



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