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Biosecurity Pig Production

猪场生物安全手册

全国畜牧总站 中国饲料工业协会

推荐手册



全国畜牧总站
中国饲料工业协会



遵照德国联邦议院的决议，由



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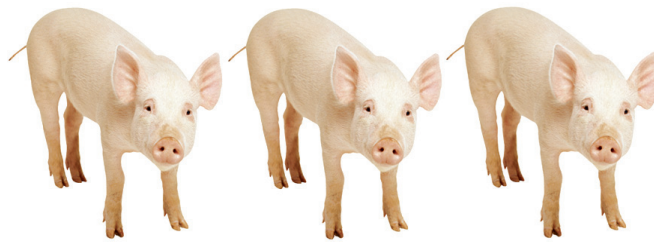
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Biosecurity Pig Production

猪场生物安全手册



All the following points listed in this document are of great importance for a well-functioning biosecurity.

本手册中的所有内容对确保生物安全极为重要



序

《猪场生物安全手册》是在中德畜牧业技术创新中心中德畜牧业合作项目框架下集合中德两国专家和从业人员力量编制成册。由德方哈曼博士和戴夫斯先生主笔、中方郭丰娟女士翻译、孙其龙先生校对完成。本手册图文并茂，结合德国猪场生物安全工作要点，从有害生物控制、牧场运输环节、人员把控、清洁消毒和饲喂安全等方面详细阐述了猪场生物安全防控的主要内容。这对于增强猪场管理和饲养人员生物安全意识，提高猪场生物安全防护工作具有借鉴和参考意义。

由于编者水平有限，不足之处在所难免，敬请有关专家和各界人士批评指正。

二〇一九年十一月五日



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1 Pest Control 有害生物管控

1.1 General thoughts 概述

The importance of biosecurity in pig production is often not sufficiently appreciated

对有害生物的管控是生物安全不可或缺的组成部分，经常会被忽视

Adequate control of rodents, birds, insects and weeds is necessary to prevent entry of diseases to the farm.

为防止致病菌侵入猪场，必须对啮齿类动物、鸟类、昆虫等进行控制，并清除杂草

Make a plan to control pests present on the farm.

根据猪场有害生物的现实情况，制定相应的防害计划

Keep record of existing pests and products used for control.

对场区有害生物的现存情况以及用于防害的产品的使用情况进行调查和记录



Use traps to control rodents.

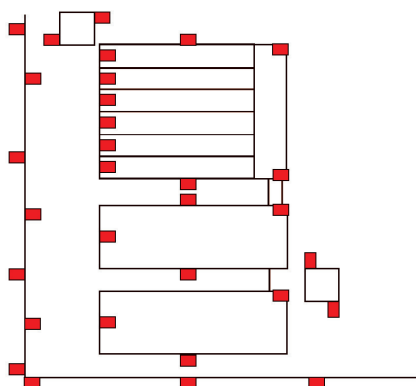
用设诱饵的方法控制和消除啮齿类动物

Traps should be placed at strategic locations that are not hazardous to children, staff and animals.

防鼠和灭鼠装置所放置的位置要避免对儿童、员工和其它动物造成伤害

Have a sketch of the location of the traps and bait-stations.

制定放置捕鼠器和诱饵的定位草图



啮齿类控制 Rodent Control						
盒子 编号 Box no.	-	毒饵采食 Baits taken			毒饵替换 replaced	
		+	++	+++	yes	no
1						
2						
3						
4						
5						

Place meshes to prevent the entry of birds into production areas.

设置防鸟网防止鸟类进入生产区

Specific insecticides must be used for the control of flies.

必须使用特定的杀虫制剂控制蚊蝇类有害生物



Keep the farm free of garbage, waste and dirt.

保持猪场清洁，清除垃圾、废弃物和污染物

1.2 Rodent Control 啮齿类动物防控

Rats and house mice occur worldwide as pests around people. They exist at our cellars, in the sewers, on dumpsters, in parks, in warehouses and first of all on farms. Rats can cause not only significant damage to supplies and to materials, but they also carry and spread deadly diseases for people and farm animals. The fight against the rodents is often underestimated. They are besides other vectors responsible for serious outbreaks in the past like FMD (= Food and Mouth Disease) and CSF (= Classical Swine Fever) in Europe. The rodents must also be seen as a big thread for spreading ASF in Europe and especially in China at the moment.

在猪业生产中鼠类被认定为有害生物，出现在世界各地，可以存活在地窖、下水道、垃圾箱、公园、仓库等处，在牧场尤为可见。鼠类不仅会对生产物资和设施设备造成严重的损害，而且还会携带和传播给牧场牲畜和人员致命的病菌。对啮齿类动物，尤其鼠类防控的重要性常常被低估。在过去欧洲爆发口蹄疫和猪瘟时，除了其它传播媒介外，鼠类造成的破坏和损失非常大！啮齿类动物对非洲猪瘟在欧洲，特别是当下在中国的传播是巨大的威胁，必须引起足够的重视！



Recognition of live or dead rodents.

辨识出存活或死亡的啮齿类动物

Droppings like faeces or insulating material.

是否存在鼠粪或鼠类造成的污垢，房舍的绝缘材料是否被破坏（鼠类筑巢处）

Runways, inside and outside.

在建筑内外活动的轨迹

Tunnels, holes signs of movement.

地道、鼠洞 活动迹象

Check with ultraviolet light and have a look for faeces and urine.

用紫外线灯照射查看是否存在鼠粪和鼠尿



引自 Figure 1 Runways of rodents out and inside of buildings (Source: BMEL, 2018)



Commensal rodents, *Rattus norvegicus* (brown rat), *Rattus flavipectus* (black rat) and *Mus musculus* (house mouse), are the most important pests both in urban and rural regions.

棕鼠、黑鼠和家鼠是同类鼠中在城乡地区危害最大的啮齿类动物。

1.3 Biological key data of rats and mice

鼠类生物学数据

	Brown rat 棕鼠	Black rat 黑鼠	House mouse 家鼠
Body weight (g)	100 - 500	100- 300	17 - 36
体重 (克)	100 - 500	100- 300	17 - 36
Reproduction 繁殖力	year-round 全年均可繁殖		
Sexual maturity 性成熟	3 - 4 months 3-4 个月	3 - 4 months 3-4 个月	1 - 2 months 1-2 个月
Litters per year 年产窝数	up to 7 高达 7 窝	up to 7 高达 7 窝	up to 10 高达 10 窝
Hatchlings per litter 每窝幼仔数	4 to 8 4-8 只		
Gestation perio 妊娠期	approx. 3 weeks 大约 3 周		



Life expectancy 预期寿命	12 - 24 months 12-24 个月		
Natural behaviour 自然行为	Climbs, swims and dives well; lives outside, also in buildings and in the sewerage; builds also earth-nests 善于攀爬、游水和潜水；存活在建筑内外区域和下水道里；地下巢居	Very good climber; lives within buildings 善善于攀爬；存活在建筑内	builds no holes in the ground; climbs; avoids water; lives also outside of buildings 不建土巢；能攀爬；不喜水；建筑内外均可存活
Foraging 觅食力	Omnivores; once adopted feeding places are always re-visited 杂食；一旦适应觅食场地，总会反复出现	Omnivorous, Omnivorous, prefers herbal feed; feeding places are visited less regular 杂食，喜草本食物；觅食地点不固定	Omnivorous, prefers herbal feed; sporadic use of feed sources 杂食，偏好草本食物；觅食地点不固定，不定时出现在觅食点
Activity time 活动时间	Nocturnal animal 昼伏夜出		

引自 Table 1 Source: BMEL, 2018

1.4 Reasons for a rodent control 防控啮齿类动物的原因



1.4.1 Rodents are carrier and important vectors for important pig diseases.

啮齿类动物携带致病菌，传播疫病，是养猪业的重大隐患

Around 100 diseases can be transmitted from rodents to humans and animals. For animals and humans should be mentioned among other things:

约有 100 种疾病可以由啮齿类动物传染给人类和其它动物，其中涉及：

Disease 疾病	Agent 媒介物	Rodents implicated 涉及的啮齿类动物
African Swine Fever 非洲猪瘟	Virus 病毒	Rats 大鼠
Classical Swine Fever 猪瘟	Virus 病毒	Rats 大鼠
Typhus 斑疹伤寒	Salmonella 沙门氏菌属	Rats 大鼠
Bordetellosis 波氏菌病	Bacteria 细菌	Rats 大鼠
Encephalomyocarditis 脑心肌炎	Virus 病毒	Rats, mice 大鼠、小家鼠
Leptospirosis 钩端螺旋体	Bacteria 细菌	Rats, mice 大鼠、小家鼠



Pseudorabies 伪狂犬	Virus 病毒	Rats 大鼠
Salmonellosis 沙门氏菌	Bacteria 细菌	Rats, mice 大鼠、小家鼠
Swine Dysenterie 猪痢疾	Bacteria 细菌	Rats, mice 大鼠、小家鼠
Swine Erysipelas 猪丹毒	Bacteria 细菌	Rats 大鼠
Toxoplasmosis 弓形体	Protozoa 原生动物	Various rodents 多种啮齿类动物
Trichinosis 旋毛虫病	Nematodes 线虫类	Rats 大鼠
Hantavirus infections 汉坦病毒感染	Virus 病毒	Mice 小家鼠

引自 Figure 2 Source: PIH-107, 2010, fc 2019

Also, parasites are introduced via rats and mice, such as ticks, fleas and tapeworms.

此外，大鼠和小家鼠还会传播寄生虫，如蜱虫、跳蚤和绦虫类。

1.4.2 Spread or accelerate the spread of diseases.

传播或加速疾病的传播



1.4.3 Attract other predators, rodents are also a food source.

会吸引其它动物聚集（啮齿类动物会被其它动物捕食），造成更大的损失

1.5 Steps of rodent control

管控啮齿类动物的措施

1.5.1 Sanitation 环境卫生

Plant free area around the buildings

清除建筑周围的植物

Clean and remove any garbage, waste and dirt!!!

清洁和清除所有垃圾、废物和污染物！！！！

Grass must be cut regularly

定期修剪草坪

Search for holes in the grass and place baits in holes

寻找草坪上的鼠洞，放置诱饵



引自 Figure 3 Perfect habitat for rodents (Source: BMEL, 2018)

1.5.2 Rodent proof construction 猪场建筑防鼠措施

Buildings need to be rodent proofed.

具备防止鼠类进入猪场的措施

Close holes, cracks and improve the surrounding area of the buildings

封闭孔洞、裂缝，改善建筑物周围环境

Keep any doors, windows and entries for humans closed.

人员进出时关闭好所有的门、窗和入口



Lay a band of gravel around the buildings (at least 50 cm wide).

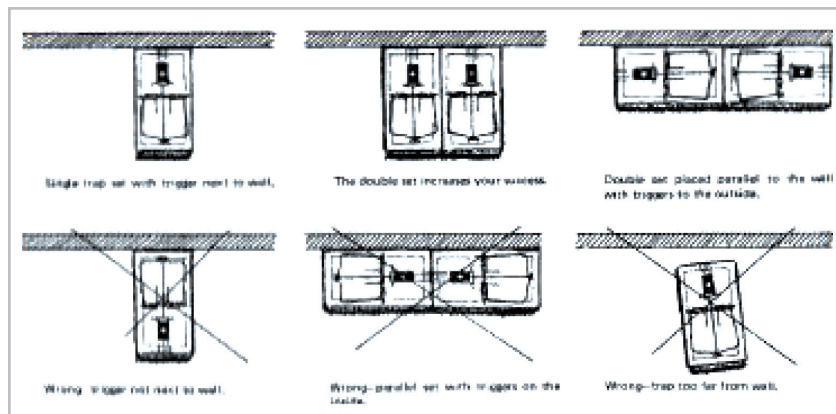
在建筑四周铺筑至少 50cm 宽的碎石道

1.5.3 Population reduction 减少数量的措施

Trapping 捕鼠夹

Set traps right against the wall, corners, dark places, where mice like to hide.

在墙壁角落、黑暗的地方贴墙设置捕鼠夹（鼠类喜欢躲藏之处）



引自 Figure 4 Source: PIH-107, 2010

1.5.4 Use of rodenticides 使用灭鼠剂



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Continuous use of toxic baits safest rat and mice reduction.

持续使用毒饵 安全的灭鼠方法

The population is kept on a low level.

有效降低数量

Using bait stations in and outside the buildings.

在建筑物内外均放置毒饵

Check the bait stations on a monthly basis.

每月检查毒饵的消耗情况

Change the brand or kind of baits keep it attractive for rodents

更换不同种类的毒饵 可保持毒饵的诱食效果

there must always be warning signs attached in visible places so that people cannot by mistake get in contact with poison

可见处必须始终有警告标志，以免人们误接触毒药

Active ingredients: Anticoagulants are inhibiting blood clotting.

活性成分：抗凝血剂可抑制血液凝结

Anticoagulants first generation: Warfarin, Coumatetralyl, Chlorophacinone, etc. have to be taken by rodents several times to be effective.

第一代抗凝血药；华法林、杀鼠醚、氯鼠酮等，啮齿类动



物必须连续多次采食才能起效。



引自 Figure 5 Different types of baits (Source: BMEL, 2018)

Advantages 优点	Disadvantages 缺点
<p>The rodents will die after a few days, so their death is not associated with the bait by their fellow rodents.</p> <p>采食后几天即会死亡，与继后的啮齿类动物采食的诱饵无关</p>	<p>The rodents can develop resistances against the bait ingredients.</p> <p>啮齿类动物可以对诱饵成分产生抵抗力</p>

Anticoagulants Second Generation: Bromadiolone and Difenacoum, later Brodifacoum, Flocoumafen and Difethialone kill effectively after the first intake by rodents.



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第二代抗凝血药：溴敌隆和鼠得克、大隆、氟鼠酮和噻鼠酮，在第一次采食后即可有效灭杀啮齿类动物。

If the rodents have developed a genetic resistance against anticoagulants of the first generation, the usage of anticoagulants of the second generation is necessary.

如果啮齿类动物对第一代抗凝血药产生了遗传抗性，则有必要使用第二代抗凝血药。

Baits with anticoagulant ingredients need to be placed in closed bait stations. So, non-target animals cannot eat them.

含抗凝剂成分的毒饵需要放置在封闭的诱饵盒内。如此，非目标动物不会受到灭鼠剂的负面影响，甚至被灭鼠剂毒死



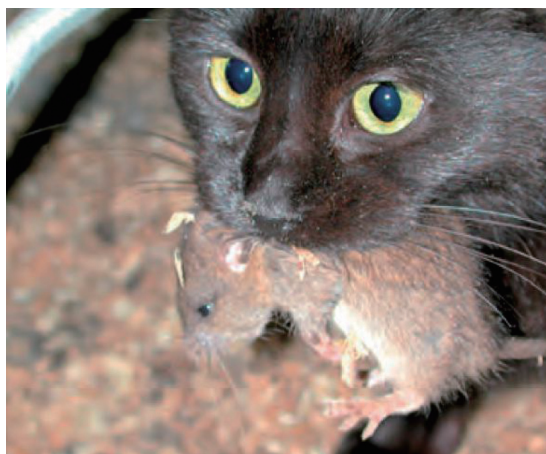
引自 Figure 6 Examples for bait stations (Source: BMEL, 2018)

1.5.5 Cats and dogs 猫狗管控



Cats and dogs are a high risk inside animal farms and therefore not allowed. Furthermore, the rodents adapt their behaviour to the existence of predators in their habitat. So an effective reduction is not achievable.

针对生物安全来说猫和狗在养殖场中属于高风险动物，因此不能在场中饲养。而且，啮齿类动物会很快适应如猫狗等捕食者的存在，所以靠猫狗来减少鼠类的措施无法实现。



引自 Figure 7 Cat with mouse (Source: BMEL, 2018)

2 Transports 运输

2.1 Something general 概述



All kinds of transports to a farm are **a high risk of introducing diseases** into the farm. Therefore, the frequency of transports must be reduced to a minimum.

进入猪场的各种运输工具都存在将疫病带入猪场的很高风险。因此，运输频率必须降至最低。

The target should be to **reduce the frequency of transports** no matter, whether they are private vehicles, feed trucks, equipment deliveries or semen deliveries not more than twice a week.

即料车、设备或精液配送车辆驶抵猪场每周不能超过两次，私人车辆驶抵猪场的频率同样要控制在最低限度。

Cleaning and disinfection of trucks is a necessary step before they come even near to the farm. A residence time should be calculated as well.

在运输车辆接近猪场之前，必须有效**清洗、消毒和烘干**。另外，还要留足停滞隔离时间。

In general trucks and vehicles need to be cleaned carefully and checked first. Subsequently they have to be disinfected. After that procedure the trucks/ vehicles are standing still for at least 2 hours and then drive to the farm.

一般来说，无论运输车还是私家车，驶近猪场前必须彻底清洗清洁，之后再有效消毒（要达到应有的消毒效果，清洗清洁起决定作用），并且消毒后必须停滞 2 小时以上方可驶



抵猪场，因为性能优异的消毒制剂均有其起效时间，对此必须严格执行。

Any **equipment or semen deliveries** are loaded over to a **delivery point and never enter the farm directly**. A special storage with ultraviolet light for disinfection and quarantine time overnight needs to be installed.

任何设备或精液配送都要中转，**绝不可直接送入猪场**。要设置带紫外线杀菌灯的特殊仓储点，用于物品消毒和夜间隔离使用。

Foreign pig trucks will never come near to the farm, because it is unknown where they have been before. So, pigs are loaded on to company owned trucks and brought to special and marked loading area to be loaded to foreign trucks.

因不能确准外来的猪只运输车辆事前经过或抵达过何处，因而这些车辆**绝不可直接接近场区**。必须用猪场自有运输车辆将猪只运至有特殊标识的特定的转运区域，转载到外来车辆上运走。

2.2 Feed delivery 饲料配送

Start on Monday

建议：周一 开始配送饲料



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First deliver feed to the high value farms (like breeding farm and boar station)

先给高端种猪场配送，如原种场和公猪站

Then the others (growing out, fattening)

然后给种猪培育场和其它养殖场配送，如育肥场

If possible feed delivery only once a week

如果可以实现，每周只送一次

Washing and disinfection (cresol 4% highly recommended) of the feed trucks on Saturday

经一周配送运输后，周六清洗和消毒饲料运输车（强烈推荐德国帝赞消毒剂 4% 泡沫混合液，确保安全）

Trucks need to be clean, otherwise disinfection is ineffective

运输车首先需要清洗清洁后消毒，否则消毒只会徒劳并伤财

Sunday: feed trucks are not moved

周日：运输车停驶一天！

So, you need a feed storage at all farms at least for 10 days

如此预估，猪场料库要达到至少可储存 10 天的存料量



2.3 Pig trucks 猪只运输车辆处理

Don't move the truck at least for 24 hours (after a successful washing and disinfection), before going to a farm after driving to customers.

使用自有车辆，在给客户运输猪只后，必须彻底有效地清洗消毒车辆，随后停滞 24 小时后方可再驶往猪场装载要销售给客户的猪只

Wash the truck directly after usage, first from the inside and then from the outside

每次运输后直接清洗车辆，先内后外，彻底清洗清洁

Use high pressure machines (>100 bar) and hot water

使用高压冲洗设备（> 100 bar）和热水进行清洗

Use alkaline soaking liquid for washing

使用碱性清洗剂

After washing Disinfection from the inside and then from the outside

先清洗后消毒，消毒时同样先内后外，每次均必须按此顺序进行



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Drivers are not allowed to enter the stables; they stay on the truck!!!

驾驶员不可进入圈舍，并且，在没有穿戴好防疫服和工作靴或鞋套前不得踏

出驾驶室！！！！

For loading pigs, use farm owned equipment and leave it there

如将猪只运抵客户猪场，必须使用客户猪场的设备和工具卸载猪只，并且使用后留在客户猪场

Wash your hands after, also use hand disinfection

猪只装载完毕后，用免手洗消毒凝胶消毒双手

2 pairs of shoes/boots

准备两双工作鞋（防疫靴）

◆ one for outside the truck and one for entering the loading space

◆ 其中一双下车前穿好，之后才能下车，另外一双进入装猪台区域时穿好

◆ Wash and disinfect them every time

◆ 每次使用完后均需清洗和消毒

Drivers are not allowed to carry any food with them (high risk



material)

司机不得携带任何食物（高风险）

3 People' s behaviour 人员把控

3.1 Biosafety concerning customers 客户来访时

Vehicles, which don't belong to the company shall not be near the farms

外来车辆不得停放在场区附近

Reception of customers at the office in town, then go to the growing out-farm by company owned vehicles

要在远离场区的办公室接待客户，之后乘坐猪场自有车辆抵达场区选猪

At the office costumers get disposable overalls and shoe covers (2 pairs) washing hands with soap (liquid soap) and hand disinfection

来访客户在远离场区的办公室用洗手液洗手，然后用消毒液消毒，让客户穿戴一次性鞋套（2层）和一次性隔离服。乘坐指定车辆到场区后，再次用洗手液洗手和消毒，脱下外层鞋套，保留里面一层鞋套后才能进入展厅选猪



no meals inside the farms for costumers, no potential germs near to the farms

客户不能在场内就餐，猪场附近清除潜在细菌



引自 Figure 8 Disposable overall and shoe covers (Source: www.chemmanager.com, 2019)

3.2 Shoe disinfection 工作靴 / 鞋消毒

NaOH is very aggressive, to shoes and feet (shoes with holes)

火碱对工作靴 / 鞋有很强的腐蚀性，如果靴 / 鞋有漏洞，会强烈腐蚀脚部皮肤

Better would be Neopredisan-4%, remember the soaking time 2 minutes, at least 5cm deep in one container and change the dirty



liquid everyday

推荐使用德国帝赞消毒剂（4% 浓度）消毒工作靴 / 鞋，消毒盆内混合液深度为至少 5 厘米，每次消毒需停留 2 分钟，每天更换消毒混合液

Shoes or boots must be clean, otherwise disinfection is not effective

消毒前靴 / 鞋必须清洁干净，否则根本达不到消毒效果

Replace the disinfectant inside the bowls regularly

每天定时更换消毒混合液

3.3 Suggestions for farm workers

员工必须遵循的制度

Reduce persons traffic to minimum

人员流动降至最低

No private vehicles inside the farm (motorcycles for example)

场内不得存放私家车（例如摩托车）

Find a save spot outside the farm for them



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在场区外设定一个安全的停车区停放车辆

Workers, who have been outside, need to follow special rules:

人员外出回场时必须遵循以下特殊规定：

Shower directly after entering the black area of the farm

进入生产污区（即入场区）前必须沐浴

Shower again, when they enter the white area and start their work

进入净区（即生产区）前必须再次沐浴

Wash your hair!!!

必须清洗头发！！！！

Using Shampoo and shower gel

使用洗发水和沐浴露

Defecate and urinate only on toilet, not anywhere else

只在厕所如厕

Wash hands after with liquid soap, no soap bars, otherwise we spread potential germs from one to another

用洗手液洗手，不要用肥皂，否则会增加交叉感染的机率

Workers, who went out, need stay in the black area for 48 hours

外出返回的员工必须隔离 48 小时



In the canteen:

进入职工餐厅时：

Washing hands before having a meal

饭前洗手

Washing hands, and use hand disinfection after

饭后用消毒剂洗手

Food comes from the outside and is a risk

所有外来食物均会造成潜在风险

they need to have a health certificate and regular medical checks,
particular for intestinal parasites (stool sample)

农场工人需要有健康证明和定期体检，特别是肠道寄生虫
(粪便样本)



3.3.1 Cleaning and disinfection of boots

工作靴清洗和消毒

Cleaning and disinfection of the boots before and after changing to another production area

在进入生产区之前和之后均必须清洗和消毒工作靴。

3.3.2 Washing and disinfecting hands 1

双手清洗和消毒 1

Washing and disinfecting hands before and after entering another production area

在进入生产区之前和之后均必须清洁和消毒双手。

3.3.3 Washing and disinfecting hands 2

双手清洗和消毒 2

Washing hands after using the toilet → human faeces: high risk for diseases.

如厕后必须洗手 → 人体粪便；传播疫病风险高。

3.3.4 Pathways 通道



Only use paved pathways

只走硬化修整过的道路。

3.3.5 Human Food delivery 人员食物配送

It is not allowed to go inside the farm and take human food with you from the outside.

进入生产区时，不允许携带任何外来食物。

3.3.6 Visitors/ foreign workers 来访人员

Registration of visitors and foreign workers

来访人员进场必须登记

Reduce traffic of foreign vehicles and workers to a minimum, only if absolutely necessary

尽最大可能减少来访人员和来访车辆数量

Check foreign workers and their belongings, no risky materials inside the farm

检查来访人员随带物品并消毒(尤其需注意是否携带食品), 避免因此导致的任何潜在风险



4. Cleaning and disinfection

清洗清洁和消毒

4.1 Six steps of cleaning and disinfection a stable

生产圈舍清洗清洁和消毒六步法

1.Remove faeces and feed remains

第一步：人工清除剩余饲料和粪污

2.Rough pre-washing only with water

第二步：用水进行粗略预清洗

3.Soaking

第三步：浸泡

4.Cleaning, very precisely, high pressure, use warm water

第四步：用高压设备和热水彻底清洗清洁

5.Dry out

第五步：干燥处理

6.Disinfection

第六步：圈舍消毒



Disease prevention and biosecurity are a complex problem: It starts with cleaning and disinfection and goes on with vaccination and medical treatment.

疫病预防和生物安全尽管复杂，但属于猪场经营的根本环节，始于清洗清洁和消毒，同时必须持续落实疫苗接种和药物治疗工作。

4.1.1 Step 1: Remove faeces and feed remains

第一步：清除剩余饲料和粪污

Remove faeces and feed remains from the stable, manually
人工清除生产圈舍内的剩余饲料和块状粪便等粪污

Start cleaning directly after the animal transfer
猪只转群后立刻着手清除

Remove faeces, urine, dust and old feed from the stable
清除沉渣、粪污、灰渍和剩余饲料

Remove garbage and other things from the stable
清除生产圈舍中的垃圾和废弃物

Control and perhaps fix the electric facilities
检查并修复电力设施设备



4.1.2 Step 2: Pre-washing 第二步：预清洗

Washing only with water

用水进行清洗即可

4.1.3 Step 3: Soaking 第三步：浸泡

Warm water is helpful.

温水效果更好

Use a special soaking liquid to crack protein and fat.

使用特殊浸湿液或清洗剂（必须是碱性）彻底清除蛋白质和脂肪残留物

Soak only what you can clean in the next 60 minutes.

只浸湿 60 分钟内可有效清洁的物品和设施设备等

Do not forget the ceiling and the walls.

舍顶和墙壁也必须清洁



引自 Figure 9 Soaking a stable (Source; Menno Chemie, 2019)



The efficiency of the disinfection is ensured by a good cleaning. Grease films that close the pores and capillaries of surfaces must be removed in order to expose underlying inclusions as far as possible.

只有事先落实了有效的清洗清洁措施，除去了因有机污染物造成的油脂膜和物体表面的微小气泡，即去除了肉眼不能看到的潜在污染物之后，才能确保消毒效果，否则只会徒劳和伤财。



4.1.4 Step 4: Washing a stable

第四步：彻底清洗圈舍

Don't wait some days, do it directly.

切不可暂等时日，必须立刻清洗！

A good cleaning is 99% of the disinfection.

消毒效果的 99% 取决于消毒前清洗清洁工作是否有效落实

Use warm water, if possible.

如有条件，请用温水清洗



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Use pressure washer and plenty of water to clean everything.

用高压水枪和足够温水清洗要消毒的各处及各类物品

Clean also the office, the floor in front of the stable and all other rooms, which belong to this production area.

还要清洗办公室、办公区，以及生产圈舍门前的地面和属于生产使用的所有房舍

Don't clean the underfloor storage.

暂不用清洗圈舍集粪沟

Clean the water pipes.

清洗水管

Clean the feed pipes.

清洗料管

Clean the feed silo inside and remove the old feed.

清洗料塔内部，清除残料

Don't forget the ceiling and the walls.

舍顶和墙壁也必须清洗清洁

At last put the manure out of the underfloor storage.

最后把粪污和其它混合物从圈舍集粪沟中排出



4.1.5 Step 5: Dry out 第五步：干燥处理

After cleaning, the concrete surfaces have to dry (must be “grey”), since otherwise the disinfectant solution is diluted on the surface.

清洁后，墙壁等混凝土表面必须干燥（必须是原灰色），否则消毒剂溶液在消毒处表面会被残留的水分继续稀释而达不到应有的消毒效果。

Methods of drying the stables: 1. over night; 2. Heating and ventilation on for drying

干燥处理方法：1、关闭门窗，确保通风，空置一夜；2、特殊气候条件或天气下，关闭门窗加温干燥处理。

4.1.6 Step 6: Disinfection 第六步：圈舍消毒

Before you start disinfecting the room must be completely dry.

开始消毒前，圈舍一定要确保已完全干燥

Don't use aldehyde or glutaraldehyde for disinfection, they do not work below a room temperature of 20 degrees Celsius.

不要使用含醛或戊二醛的消毒剂，因为此类消毒剂在室温低于 20 度时失效！

Use cresols for disinfection, they work at any temperature.

要使用甲酚类消毒剂进行消毒，因其有效性不受温度影响



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Don't use fog, but foaming, because it's very dangerous (aerosol) for the farm worker's health.

要采用泡沫式消毒方法！不要采用喷雾式消毒，因为除了其它不利因素以外，因喷雾产生的气溶胶对牲畜和人体健康有很大的损害

To calculate the right amount, it is important to know that you need 0.4 litre per m² of disinfectant dilution.

正确计算用量提示：消毒混合液用量 0.4 升 /m²

So simple Maths $0.4 \times 0.02 = 0.008$ l so you need 8 ml pure disinfectant per m² for a 2% solution

简单的数学公式 $0.4 \times 0.02 = 0.008$ 升需要 8 毫升 /m² 消毒剂原液即能获得 2% 的泡沫混合溶液

For a 4% solution you need 16 ml/m²

配比 4% 的混合溶液，需要 16 毫升 /m² 消毒剂原液

Attention: Lower concentrations are useless and can also cause resistances!!

注意：配比浓度不足时消毒无效，而且会阻碍最终的消毒杀菌效果！！



Disinfect walls, floors, pens, facilities, tools, work boots, transport vehicles etc.

要对包括圈舍墙壁、地面、栏位、设施设备、工具、工作靴、运输车辆等进行消毒

To calculate the surface of a house

预估计算圈舍需消毒面积的方法：

Farrowing: 2.5 x floor space

分娩舍： $2.5 \times$ 地面面积

All other houses in general: 2 x floor space

其它猪舍： $2 \times$ 地板面积

You also can calculate the exact surface by measuring the floor, walls, ceiling and all parts of the pen and so on

也可以通过测量所有的地面、栏位、墙壁、舍顶等来计算精确的消毒面积

4.2 Pathways for pigs 猪只驱赶通道

Clean the pathways directly after stalling / moving pigs.

转栏后必须直接清洗驱赶通道



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Use disinfection only after drying.

只有在干燥处理后再消毒才能达到应有效果

Use disinfection every morning before using the pathways:

每天早上驱赶猪只前必须进行清洗消毒；

We don't know what happened at night!!

因为很难准确获知夜间发生了什么！！

4.3 Truck Wash 猪只运输车辆清洗清洁和消毒

1 Removal of all manure and bedding

清除所有粪便和垫料

2 Soaking with soap and/or degreaser

用肥皂 / 或脱脂剂浸泡

3 Pressure washing with hot water is most effective vs. cold water wash

与冷水清洗清洁相比，用热水进行高压清洗更有效

4 Disinfecting by foaming with an appropriate disinfectant

使用合适的、产生泡沫状混合液的消毒剂进行消毒

5 Drying

干燥后再进行消毒



Keep the cargo area free of manure, manually

人工清除装卸区粪污

Apply soap according to label instructions inside and outside

根据肥皂类清洁剂使用说明书进行车辆内、外部清洗清洁操作

Do not let the detergent dry out.

在肥皂类清洁剂变干前进行下一步操作

Working from the top going down, high pressure wash required including ramps, gates, boards, brooms, shovels and dirty and clean boxes.

要按从上向下的顺序清洗清洁，高压冲洗，包括运输车辆升降台、车门、挡猪板、扫帚、铲子和使用的箱子或盒子等

Apply disinfectant to all.

运输车辆所有部位均需消毒

Clean and disinfect the driver's cab. Be sure that the pedals and the floor of the cab are clean.

清洁和消毒驾驶室，确保驾驶室的踏板和地面清洁

Put on new shoe covers, then clean the cab from the inside, such as steering wheel, door handles, and dashboard.

穿上新的鞋套后清洁驾驶室，如方向盘、门把手和仪表盘等



5 Feed Safety 饲喂营养安全

5.1 Something general 概述

Exposure to germs of any kind must be absolutely avoided and monitored in regular intervals!

必须避免接触任何种类的细菌，并定期进行监测！

The entire feed supply chain, from the storage of the raw components to the preparation of the feed mixture, from the transport routes to the pig feeding system, must be closely observed!

必须密切关注整个饲料供应链，即从原料的储存到饲料加工，从饲料运输到猪场内部饲喂系统中的每一个环节！

If too little attention is paid to hygiene in liquid feeding systems, the feed lines might develop bio films, which act as a nutritional solution for the growth of different bacteria.

饲喂液态料也必须注意饲喂系统的清洁卫生，否则料线内部会形成生物膜，成为不同细菌滋生的营养液。

The quality of the water, which is one of the most important feeding components in pig rearing, should be checked regularly (human drinking water quality)!



水质是养猪营养环节中最重要的组成部分之一，必须定期检查（饮用水质量与人类一样）！

5.2 Silo areal 料塔区域管理

The silo areal must be clean at any time

料塔区域在任何时候都必须保持洁净

Contamination with bacteria and fungi can occur

否则会引起细菌和真菌感染

Continuous rodent control

在此区域也必须持续落实灭鼠等消灭啮齿类动物的有效措施

5.3 Feeding Hygiene inside the stable

车间内部饲喂卫生

Adjust the feeders, so that the pigs are able to finish it.

调整饲喂器开关，确保猪只可以一次性采食完毕，不遗留残料

Left feed inside the troughs is always a risk for microorganisms and bacteria (diarrhoea).



料槽内的残料会导致滋生微生物和细菌（如造成腹泻）

Poor feeding hygiene can cause poor intake and weight gain.

恶劣的营养卫生条件会影响饲料摄入量和日增重

Economical aspect → Reducing of feed loss.

降低饲料损失率和经营效益之间存在必然关系

5.4 Hygiene of the water-system 饮水系统卫生

Water and water pipe hygiene.

确保水质和水管卫生

Drinking water especially from own wells need 2 times a year bacterial assay (chemical-physical and bacteriological – danger: salmonella!).

尤其是如果采用自掘井水，必须每年进行 2 次水质检测！（化学、物理和细菌学均证明采用井水的风险：沙门氏菌！）

High manganese, nitrite and nitrate levels can lead to poor development and lack of acceptance.

高锰、亚硝酸盐和硝酸盐含量过高会导致猪只拒绝饮水和发育不良

Perform germ-reducing measures (drinking water disinfection,



water treatment, chlorination, acidification, etc.).

落实杀菌措施（饮用水消毒、水处理、氯化、酸化等）

Attention!! Products used in the current mast must be approved as feed additives!!

注意：使用的杀菌消毒用品必须已得到了官方的审批认可！！

The water pipe system should be cleaned from time to time.

饮水系统必须可以随时清洗

Hygiene in the water supply always also depends on the equipment.

饮水系统卫生还取决于饮水设备的维护和保养效果

Long troughs with aqua level need to be checked after feeding.

长形水槽需要在饲喂后用类似德国 aqua level 的检查仪检查其供水水位是否正常

Food remains must be removed, so all pigs are able to drink.

料槽里面的剩料必须清除，以便确保所有猪只饮水不受影响

Bowls are more accepted by pigs, the water intake is higher.

猪只更喜欢用饮水碗饮水，摄入水量会更大

→but they must be checked and cleaned every day

→ 必须每天检查和清理饮水碗