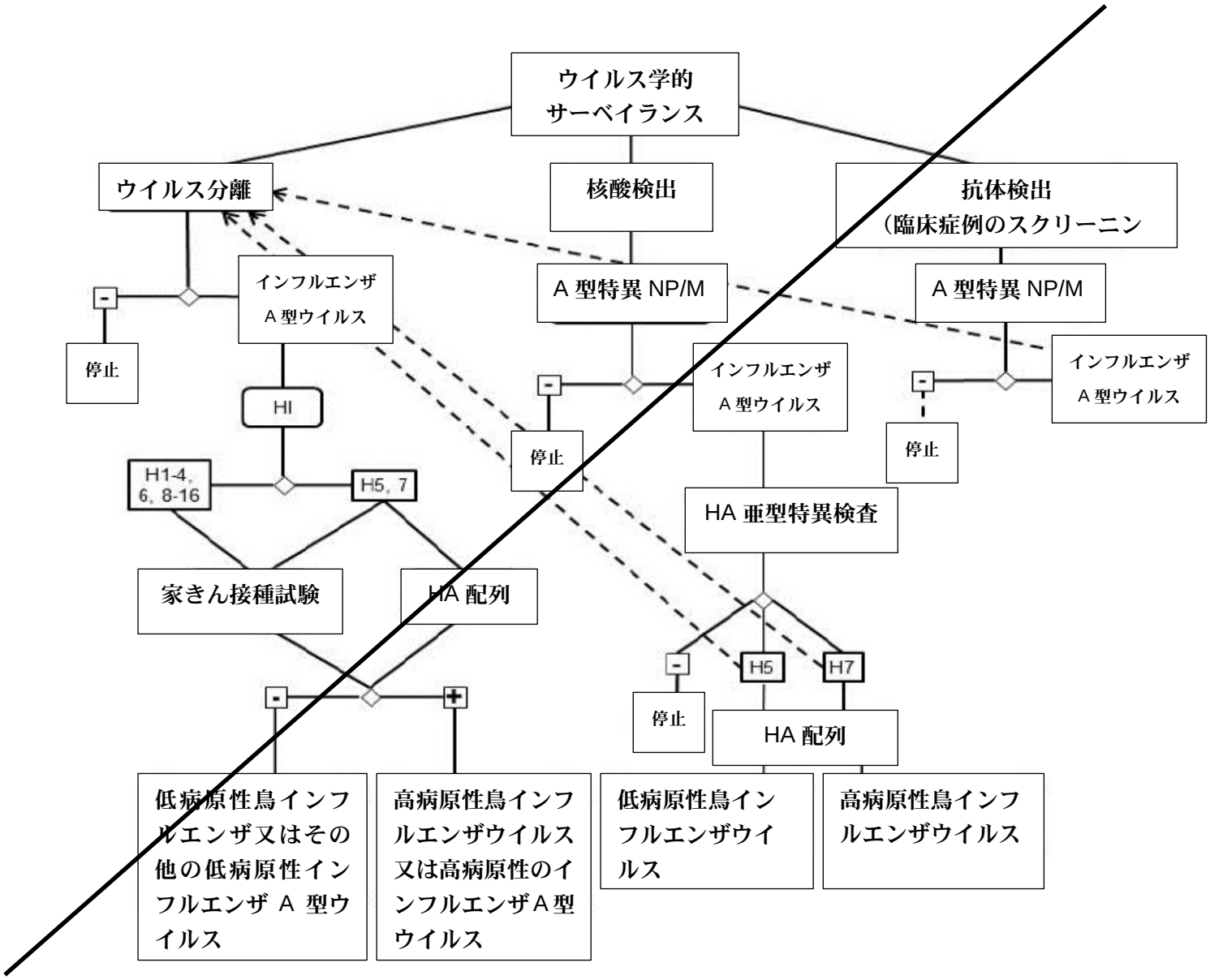
~~図2. ウイルス学的方法を使用した~~
~~鳥インフルエンザの証拠を確定するための~~
~~検査施設内検査の図解描写~~



参考資料3

CHAPTER 14.7.

INFECTION WITH PESTE DES PETITS RUMINANTS VIRUS

[...]

Article 14.7.3.

~~PPR free~~ ~~c~~Country or zone free from PPR

A country or *zone* may be considered free from PPR when the relevant provisions ~~of~~ in point 2 of Article 1.4.6. ~~and Chapter 1.6.~~ have been complied with, and when within the proposed free country or *zone* for at least the past 24 months:

1) there has been no *case* of *infection* with PPRV;

2) the *Veterinary Authority* has current knowledge of, and authority over, all domestic sheep and goats in the country or *zone*;

3) appropriate *surveillance* has been implemented in accordance with:

   a) ~~Chapter~~ Article 1.4.6. where historical freedom can be demonstrated; or

   b) Articles 14.7.27. to 14.7.33. where historical freedom cannot be demonstrated;

4) measures to prevent the introduction of the *infection* have been in place: in particular, the importations or movements of *commodities* into the country or *zone* have been carried out in accordance with this chapter and other relevant chapters of the *Terrestrial Code*;

5) no *vaccination* against PPR has been carried out;

~~5~~6) no animals vaccinated against PPR have been introduced since the cessation of *vaccination*. [under study]

~~1) The PPR status of a country or *zone* should be determined on the basis of the following criteria, as applicable:~~

   ~~*a)* PPR is notifiable in the whole territory, and all clinical signs suggestive of PPR should be subjected to appropriate field or *laboratory* investigations;~~

   ~~*b)* an ongoing awareness programme is in place to encourage reporting of all cases suggestive of PPR;~~

   ~~*c)* systematic *vaccination* against PPR is prohibited;~~

   ~~*d)* importation of domestic ruminants and their semen, oocytes or embryos is carried out in accordance with this chapter;~~

   ~~*e)* the *Veterinary Authority* has current knowledge of, and authority over, all domestic sheep and goats in the country or *zone*;~~

   ~~*f)* appropriate *surveillance*, capable of detecting the presence of *infection* even in the absence of clinical signs, is in place; this may be achieved through a *surveillance* programme in accordance with Articles 14.7.27. to 14.7.33.~~

Annex 16 (contd)

~~2) To qualify for inclusion in the list of PPR free countries or *zones*, a Member Country should either:~~

~~*a)* apply for recognition of historical freedom as described in point 1) of Article 1.4.6.; or~~

~~*b)* apply for recognition of freedom and submit to the OIE:~~

~~*i)* a record of regular and prompt animal disease reporting;~~

~~*ii)* a declaration stating that:~~

~~– there has been no *outbreak* of PPR during the past 24 months;~~

~~– no evidence of PPRV *infection* has been found during the past 24 months;~~

~~– no *vaccination* against PPR has been carried out during the past 24 months;~~

~~– importation of domestic ruminants and their semen, oocytes or embryos is carried out in accordance with this chapter;~~

~~*iii)* supply documented evidence that *surveillance* in accordance with Chapter 1.4. is in operation and that regulatory measures for the prevention and control of PPR have been implemented;~~

~~*iv)* evidence that no animals vaccinated against PPR have been imported since the cessation of *vaccination*.~~

~~The Member Country will be included in the list only after the application and submitted evidence has been accepted by the OIE. Changes in the epidemiological situation or other significant events should be reported to the OIE in accordance with the requirements in Chapter 1.1.~~

The country or the *zone* will be included in the list of countries or *zones* free from PPR in accordance with Chapter 1.6.

Retention on the list requires ~~annual reconfirmation of point 2) above~~ annual reconfirmation of all points above and relevant points under point 4 of Article 1.4.6. Documented evidence should be resubmitted annually for ~~that information in point 4 *d)* of Article 1.4.6. and~~ points 1) to ~~3~~4) above. ~~above be re-submitted annually and~~ Any changes in the epidemiological situation or other significant events ~~including those relevant to points 4 a) to 4 c) of Article 1.4.6. and points 4) and 5) above~~ should be ~~reported~~ notified to the OIE in accordance with Chapter 1.1.

[...]

Article 14.7.7.

Recovery of free status

~~When~~ Should an ~~a PPR~~ *outbreak* of PPR ~~or PPRV *infection*~~ occur~~s~~ in a previously ~~PPR~~ free country or *zone*, its status may be restored ~~and when a *stamping-out policy* is practised, the recovery period shall be~~ six months after the ~~*slaughter* of the last *case*~~ *disinfection* of the last affected *establishment*, provided that: ~~Article 14.7.32. has been complied with~~

1) a *stamping-out policy* has been implemented;

2) *surveillance* in accordance with Article 14.7.32. has been carried out with negative results.

~~If a *stamping-out policy* is not applied~~ Otherwise, Article 14.7.3. applies.

The country or *zone* will regain PPR free status only after the submitted evidence has been accepted by the OIE.

[…]

Article 14.7.24.

Recommendations for importation from countries or zones considered infected with PPRV

For wool, hair, raw hides and skins from sheep and goats

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that~~:~~ the products were ~~adequately~~ processed in accordance with one of the following, ~~procedures referred to in Article 8.8.34.~~ in premises controlled and approved by the *Veterinary Authority* of the *exporting country*:

1. For wool and hair:

   a) industrial washing, which consists of the immersion of the wool in a series of baths of water, soap and sodium hydroxide (soda) or potassium hydroxide (potash);

   b) chemical depilation by means of slaked lime or sodium sulphide;

   c) fumigation with formaldehyde in a hermetically sealed chamber for at least 24 hours;

   d) industrial scouring which consists of the immersion of wool in a water-soluble detergent held at 60-70°C;

   e) storage of wool at 4°C for four months, 18°C for four weeks or 37°C for eight days;

   f) the necessary precautions were taken after processing to avoid contact of the *commodities* with any potential source of PPRV.

2. For raw hides and skins:

   a) treatment for at least 28 days with salt (NaCl) containing 2% sodium carbonate (Na_2CO_3);

   b) the necessary precautions were taken after processing to avoid contact of the *commodities* with any potential source of PPRV.

[…]

Article 14.7.34.

OIE endorsed official control programme for PPR

~~The objective of an OIE endorsed *official control programme* for PPR is for Member Countries to progressively improve the situation in their territories and eventually attain free status for PPR.~~

Member Countries may, on a voluntary basis, apply for endorsement of their *official control programme* for PPR in accordance with Chapter 1.6., when they have implemented measures in accordance with this article.

For a Member Country's *official control programme* for PPR to be endorsed by the OIE, the Member Country should provide a detailed *official control programme* for the control and eventual eradication of PPR in the country or *zone*. This document should address and provide documented~~ary~~ evidence on the following:

1) epidemiology:

   a) the detailed epidemiological situation of PPR in the country, highlighting the current knowledge and gaps;

   b) the main livestock production systems and movement patterns of sheep and goats and their products within and into the country and, where applicable, the specific *zone*;

Annex 16 (contd)

2) surveillance and diagnostic capabilities:

a) PPR *surveillance* in place, in accordance with Chapter 1.4. and Articles 14.7.27. to 14.7.33.;

b) diagnostic capability and procedures, including regular submission of samples to a *laboratory* that carries out ~~diagnosis~~ diagnostic testing and further characterisation of strains;

c) serosurveillance conducted in susceptible species, including *wildlife*, to serve as sentinels for PPRV circulation in the country;

3) vaccination ~~strategies to reach the objectives~~:

a) where *vaccination* is practised as a part of the *official control programme* for PPR, documented~~ary~~ evidence (such as copies of national legislation, regulations and *Veterinary Authority* directives) that *vaccination* of selected populations is compulsory;~~,~~

b) ~~and~~ detailed information on *vaccination* campaigns, in particular ~~on~~:

i) the strategy that is adopted for the *vaccination* campaign;

ii) target *populations* for *vaccination*;

iii) target geographical area for *vaccination*;

iv) monitoring of *vaccination* coverage, including serological monitoring of population immunity;

v) technical specification of the vaccines used and description of the vaccine licensing procedures in place;

vi) ~~if relevant, proposed timeline for the transition to the~~ use of vaccines fully compliant with the standards and methods described in the *Terrestrial Manual*;

vii) the proposed strategy and work plan including the timeline for ~~the~~ transition to the cessation of the use of *vaccination*;

4) ~~*b)*~~ the measures implemented to prevent the introduction of the pathogenic agent~~,~~ and to ensure the rapid detection of~~, and response to~~ all PPR *outbreaks* ~~in order to reduce *outbreaks* and to eliminate PPRV circulation in domestic sheep and goats in at least one *zone* in the country~~;

5) ~~existence of~~ an emergency preparedness plan and an emergency response plan to be implemented in case of PPR *outbreaks*;

~~4~~6) ~~the defined~~ work plan and timelines of the *official control programme*;

~~5~~7) performance indicators for assessing the effectiveness of the control measures to be implemented;

~~6~~8) monitoring, evaluation and review ~~assessment of the evolution and implementation~~ of the *official control programme* to demonstrate the effectiveness of the strategies;~~.~~

~~7. existence of an emergency preparedness plan and of an emergency response plan to be implemented in case of PPR *outbreaks*.~~

~~1) submit documented evidence on the capacity of its *Veterinary Services* to control PPR; this evidence can be provided by countries following the OIE PVS Pathway;~~

~~2) submit documentation indicating that the *official control programme* for PPR is applicable to the entire territory (even if it is on a zonal basis);~~

~~3) have a record of regular and prompt animal disease reporting in accordance with the requirements in Chapter 1.1.;~~

~~4) submit a dossier on the status of PPR in the country describing the following:~~

~~*a)* the general epidemiology of PPR in the country highlighting the current knowledge and gaps;~~

~~*b)* the measures implemented to prevent introduction of *infection*, the rapid detection of, and response to, all PPR *outbreaks* in order to reduce the incidence of *outbreaks* and to eliminate virus circulation in domestic sheep and goats in at least one *zone* in the country;~~

~~*c)* the main livestock production systems and movement patterns of sheep and goats and their products within and into the country and, where applicable, the specific *zone(s)*;~~

~~5) submit a detailed plan of the programme to control and eventually eradicate PPR in the country or *zone* including:~~

~~*a)* the timeline for the programme;~~

~~*b)* the performance indicators that will be used to assess the efficacy of the control measures;~~

~~6) submit evidence that PPR *surveillance* is in place, taking into account the provisions in Chapter 1.4. and the provisions on *surveillance* in this chapter;~~

~~7) have diagnostic capability and procedures in place, including regular submission of samples to a *laboratory*;~~

~~8) where *vaccination* is practised as a part of the *official control programme* for PPR, provide evidence (such as copies of legislation) that *vaccination* of sheep and goats in the country or *zone* is compulsory;~~

~~9) if applicable, provide detailed information on *vaccination* campaigns, in particular on:~~

~~*a)* the strategy that is adopted for the *vaccination* campaign;~~

~~*b)* monitoring of *vaccination* coverage, including serological monitoring of population immunity;~~

~~*c)* serosurveillance in other susceptible species, including *wildlife* to serve as sentinels for PPRV circulation in the country;~~

~~*d)* disease *surveillance* in sheep and goat populations;~~

~~*e)* the proposed timeline for the transition to the cessation of the use of *vaccination* in order to enable demonstration of absence of virus circulation;~~

~~10) provide an emergency preparedness and contingency response plan to be implemented in case of PPR *outbreak(s)*.~~

~~The Member Country's *official control programme* for PPR will be included in the list of programmes endorsed by the OIE only after the submitted evidence has been accepted by the OIE.~~

The country will be included in the list of countries having an OIE endorsed *official control programme* for PPR in accordance with Chapter 1.6.

Retention on the list ~~of endorsed *official control programmes* for PPR~~ requires an annual update on the progress of the *official control programme* and information on significant changes concerning the points above.

~~Changes in the epidemiological situation and other significant events should be reported to the OIE in accordance with the requirements in Chapter 1.1.~~

Annex 16 (contd)

~~The OIE may withdraw the endorsement of the *official control programme* if there is evidence of:~~

- ~~non-compliance with the timelines or performance indicators of the programme; or~~
- ~~significant problems with the performance of the *Veterinary Services*; or~~
- ~~an increase in the incidence of PPR that cannot be addressed by the programme.~~

参考資料3（仮訳）

第 14 部

緬山羊の疾病

第 14.7 章

小反芻獣疫

（略）

第 14.7.3 条

小反芻獣疫清浄国又は地域

第 1.4.6 条第 2 項 ~~及び第 1.6 章~~の関連規定が遵守されており、国又は地域が、少なくとも過去 24 か月間、

1) 小反芻獣疫ウイルス感染症例がない

2) 獣医当局が、国又は地域内で飼養されるすべてのめん山羊に関する最新の情報を有し、管轄していること

3) 以下に従い適切なサーベイランスがされていること

a) ~~第 1.4 章~~第 1.4.6 条（歴史的清浄が示されている場合）、又は

b) 第 14.7.27 から第 14.7.33 条（歴史的清浄が示されない場合）

4) 感染の導入を防ぐための措置が講じられている。特に、国又は地域への*物品*の輸入や移動が、本章及びその他の陸生コードの関連章に準じて行われている。

~~4~~5) 小反芻獣疫に対する*ワクチン接種*が行われていないこと

~~5~~6) *ワクチン接種*終了以降、*ワクチン接種*された動物が導入されていないこと (under study)

~~1) 小反芻獣疫清浄国又は地域のステータスは以下の要件を基に決定される。~~

~~a) 小反芻獣疫が国又は地域の全域で通報対象であり、PPR が疑われるあらゆる臨床~~

兆候が認められた場合はは適切な分野又は検査所の調査を受けること。

b) PPR が疑われるすべての症例が報告されることを奨励する啓発プログラムが実行されていること。

c) 小反芻獣疫の計画的ワクチン接種が禁止されていること。

d) 家畜の反すう類及びその精液、卵母細胞、受精卵の輸入は本章の条件に従い輸入されること。

e) 獣医当局は、国又は地域の全域における飼養される羊と山羊について最新の情報を把握し、管轄していること。

f) 臨床症状がなくとも感染の存在が検知することができる適切なサーベイランスが実行されていること。これは、第 14.7.27 章から第 14.7.33 章に従うサーベイランスプログラムにより実現する。

2) 小反芻獣疫清浄国又は地域リストに含まれるためには、メンバー国は、

a) 第 1.4.6 章の歴史的清浄認証の申請をする；又は

b) 清浄認定を申請し、OIE に対して以下を提出する。

i) 定期的及び直近の家畜疾病報告の記録

ii) 以下のことを述べる宣言

-過去 24 カ月に小反芻獣疫の発生がないこと

-過去 24 カ月に小反芻獣疫ウイルス感染症の証拠がないこと

-過去 24 カ月に小反芻獣疫のワクチン接種が行われていないこと

-飼養される反すう類及びその精液、卵母細胞、受精卵が本章に従い輸入されていること

メンバー国は、申請及び提出根拠が OIE に認められることで初めてリストに含まれる。第 1.1 章の条件に従い、疫学状況の変化やその他の重要な出来事は OIE に報告されなければならない。

国または地域は、第 1.6 章に準じて、小反芻獣疫清浄国又は地域のリストに掲載される。

リスト掲載を維持するためには、2) の毎年の再確認が必要である。上記のすべての項目と第 1.4.6 条の第 4 項の関連事項について毎年再確認しなければならない。上記 1) から 4) まで毎年文書で再提出しなければならない。第 1.4.6 条 4 d) 及び上記 1) から 3) の情報が毎年再提出され、第 1.4.6 条 4 a) から 4 c) 及び上記 4) 5) を含む、第 1.1 章に従い、いかなる疫学状況の変化や重要な事件についても OIE に報告されなければならない。

第 14.7.7 条

清浄ステータスの回復

小反芻獣疫清浄国又は*地域*において小反芻獣疫の*発生*または小反芻獣疫ウイルス*感染*がおこり、~~*スタンピングアウト政策*が実行された場合、第 14.7.32 章が遵守されていれば、~~最終発生した*症例*の消毒完了 ~~*と畜*~~後 6 か月で、以下の条件を満たせば清浄ステータスを回復できる。

1) スタンピングアウト政策が実行された

2) 第 14.7.32 条に準ずるサーベランスが実施され、結果が陰性であること

それ以外の ~~もし*スタンピングアウト政策*が講じられなかった~~ 場合、第 14.7.3 章が適用される。

国又は地域は、提出根拠が OIE に認められて初めて小反芻獣疫清浄ステータスを回復する。

第 14.7.10 条

小反芻獣疫ウイルス汚染国と考えられる国や地域からの輸入に関する勧告

家畜羊及び山羊

*獣医当局*は、当該動物が以下の各号を満たす旨証明する*国際動物衛生証明書*の提示を義務付けるものとする。

1) 輸送前の最低 21 日間、小反芻獣疫ウイルス*感染*が疑われる臨床症状を示していないこと。

2) 及び次の各号のいずれかを満たすこと

a) 出生後以降継続的にまたは輸送前の最低 21 日間、その期間中に小反芻獣疫が報告されていない*飼育施設*で飼育され、かつ*飼育施設*は小反芻獣疫ウイルス感染*地域*に位置していないこと、または

b) 輸送前の最低 21 日間、*動物検疫所*において隔離されていたこと。

3) 及び次の各号のいずれかを満たすこと

a) PPR ワクチンが接種されておらず、発送前から 21 日以内に小反芻獣疫ウイルス感染の診断検査を受け、陰性の結果が得られていること。または

b) 輸送前の最低 21 日以上前に小反芻獣疫の弱毒化生ワクチンを接種されていること。

第 14.7.24 条

小反芻獣疫ウイルス汚染国と考えられる国や地域からの輸入に関する勧告

めん山羊の羊毛、毛、生皮及び皮

*獣医当局*は以下を保証する国際獣医証明書を要求する。輸出国の*獣医当局*により管理、承認される施設において、以下の ~~第 8.8.34 条に記載される~~ いずれかの方法に従い ~~十分~~ 加工されていること。

1) 羊毛と毛

a) 羊毛の水、石鹸、水酸化ナトリウム又は水酸化カリウム槽への浸漬処理を含む工業洗浄

b) 消石灰又は硫化ナトリウムによる化学的処理

c) 密閉容器の中で少なくとも 24 時間ホルムアルデヒドによる蒸製

d) 60-70℃に保たれた水溶性洗剤にウールを浸漬する工業精錬

e) 4℃4 か月、18℃4 週間又は 37℃8 日間の羊毛の保管

f) 加工後、小反芻獣疫ウイルスの感染源となりうる*物品*との接触を避けるために必要な注意が払われたこと

2) 生皮及び皮

a) 2%炭酸ナトリウムを含む塩による最低 28 日の処理

b) 加工後、小反芻獣疫ウイルスの感染源となりうる*物品*との接触を避けるために必要な注意が払われたこと

第 14.7.34 条

OIE の承認する小反芻獣疫公式管理プログラム

~~OIE の承認する*小反芻獣疫公管理プログラム*は、メンバー国が国内における状況を着実に改善し、最終的には小反芻獣疫清浄ステータスを獲得することを目的とする。~~

メンバー国は、本条に一致する実行中の措置がある場合、第 1.6 章に一致する小反芻獣疫*公式管理プログラム*の承認を申請することができる。

メンバー国が小反芻獣疫*公式管理プログラム*を OIE に承認されるためには、国又は*地域*における小反芻獣疫の管理及び最終的な撲滅のための*公式管理プログラム*の詳細を提供しなければならない。プログラムは、以下のことを文書により根拠を示さなければならない。~~以下の事項を満たさなければならない。~~

1 疫学

a) 国における小反芻獣疫の詳細な疫学情報。最新の情報と gaps を含むこととする。

b) 主要な畜産物のシステム及びめん山羊とその製品の、国内および国間、又は特定

地域の移動パターン。

2 サーベイランスと診断能力

a) 第 1.4 章及び第 14.7.27 から 14.7.33 条にしたがう小反芻獣疫サーベイランスの実行

b) 診断能力と手順書。診断および更なる株の特定を実行できる検査施設への定期的なサンプルの提出を含むものとする。

c) 小反芻獣疫ウイルス循環の確認を目的とした、野生動物を含む感受性動物の血清学的サーベイランス。

3 ワクチン接種 目的を達成するための戦略

a) *ワクチン接種*が小反芻獣疫*公的管理プログラム*の一環として実行されている場合、選択された郡における*ワクチン接種*が義務である文書による根拠（国の方、規則、獣医当局指示書類等）、及び*ワクチン接種*キャンペーンの詳細な情報、特に以下について。

i） *ワクチン接種*キャンペーンで採用されている戦略

ii） *ワクチン接種*対象郡

iii） *ワクチン接種*対象地域

iv） 免疫郡の血清学的モニタリングを含む、*ワクチン接種*有効性監視

v） 使用ワクチンの技術的特徴及び実行されるワクチンライセンス手順

vi） もし関係すれば、ワクチン使用 に至るライムライン が陸生マニュアルの基準及び手法に一致しているか

vii） *ワクチン接種*終了に向けたタイムラインを含む、提示される戦略とワークプラン

4 b) 病原体の導入を防ぐために実行されている 対策、発生事例を減少させ、当該国の中の少なくとも一つの地域において飼養されるめん山羊のウイルス循環を撲滅することを目的とした、すべての小反芻獣疫発生に対する早期発見、早期撲滅対策

5 小反芻獣疫発生時に実行される緊急防疫対応指針

6 4 *公的管理プログラム*における おいて決定されている ワークプランとタイムライン

7 5 実行される管理措置の効果を評価するためのパフォーマンス指標

8 6 戦略の効果を証明するための、公的管理プログラムの監視、評価、見直し 実行と進歩の評価

7 小反芻獣疫発生時に実行される、緊急防疫対応指針

1) 小反芻獣疫を管理するための*獣医サービス*能力に関する根拠の提出。この根拠は、

OIE PVS Pathway により提出してもよい。

2) 小反芻獣疫公式管理プログラムが領域全土に適用されていることを示す書類。

3) 第 1.1 章の要件に従った、定期的及び直近の家畜疾病報告を有すること

4) 以下の内容を含む小反芻獣疫のステータスについてのドシエを提出すること

a) 最近の知識や gap をハイライトした、その国における小反芻獣疫の一般的な疫学

b) 感染の侵入を防ぐために実行されている措置、発生事例を減少させること及び当該国の中の少なくとも一つの地域において飼養されるめん山羊のウイルス循環を撲滅することを目的とした、すべての小反芻獣疫発生に対する早期発見、早期撲滅

c) 主要な畜産物のシステム及びめん山羊とその製品の、国内および国間、又は特定地域の移動パターン。

5) 以下の内容を含む、国又は*地域*において小反芻獣疫を管理し、最終的には撲滅するためのプログラムの詳細な計画。

a) プログラムのタイムライン

b) 管理措置の有効性を評価するために使われる指標

6) 小反芻獣疫*サーベイランス*が実行されている証拠（第 1.4 章及び本章のサーベイランス規定を考慮すること）

7) 診断能力があること及び実行されていること（検査施設への定期的なサンプル送付を含む）

8) 小反芻獣疫*公式管理プログラム*の一環として*ワクチン接種*が実行されている場合、めん山羊の*ワクチン接種*が国又は*地域*において義務であることを示す根拠（法令など）

9) 該当すれば、*ワクチン接種*広報の詳細な情報。特に、

a) *ワクチン接種*広報の戦略

b) 免疫郡の血清学的モニタリングを含む*ワクチン接種*有効性監視

c) 当該国で小反芻獣疫ウイルス循環の指標となる野生動物を含む、他のウイルス感受性を有する種の血清学的サーベイランス

d) めん山羊の疾病*サーベイランス*

e) ウイルス循環がないことを示すための、ワクチン使用終了に移行するタイムライン

10) 小反芻獣疫*発生*時に実行される、緊急防疫対応指針

メンバー国の小反芻獣疫公式管理プログラムは、提出された根拠が OIE に認められることで初めて、プログラム承認国リストに含まれる。

国は、第 1.6 章に一致する小反芻獣疫公的管理プログラムの OIR 承認国リストに掲載される。

リスト掲載を維持するためには、公式管理プログラムの進歩及び上記のポイントに関する重要な変更の情報を毎年報告しなければならない。

第 1.1 章の条件に従い、疫学状況の変化やその他の重要な出来事は OIE に報告されなければならない。

OIE は、以下の根拠があるとき、公式管理プログラム承認を撤回することがある。

- ~~プログラムのタイムラインやパフォーマンス指標の非遵守、又は~~
- ~~獣医サービスのパフォーマンスに関する重要な問題、又は~~
- ~~プログラムにより対処できないほどの小反芻獣疫の発生の増加~~

参考資料4

DRAFT CHAPTER 7.Z.

ANIMAL WELFARE AND LAYING HEN PRODUCTION SYSTEMS

Article 7.Z.1.

Definitions

For the purposes of this chapter:

Laying hens ~~(hens):~~ means sexually mature female birds of the species *Gallus gallus domesticus* kept for the commercial production of eggs for human consumption. ~~Laying hens kept in village or backyard *flocks* are excluded.~~ Breeding hens are not included~~excluded~~.

End-of-lay hens~~:~~ means laying hens at the end of their productive lives.

Layer pullets ~~(pullets):~~ means female birds of the species *Gallus gallus domesticus* raised for commercial layer production purposes from hatch until the onset of sexual maturity.

Article 7.Z.2.

Scope

This chapter provides recommendations for the ~~addresses the~~ *animal welfare* aspects of commercial laying hen production systems. ~~This chapter~~ It covers the production period from the arrival of *day-old birds* onto the pullet-rearing farm through to the removal of end-of-lay hens from the laying production facilities. Laying hens kept in village or backyard flocks and used to produce eggs for personal consumption are not included ~~excluded~~.

Commercial laying hen production systems involve the confinement of layer pullets and laying hens~~birds~~, the application of *biosecurity* and trade in ~~the~~ eggs or pullets.

These recommendations ~~cover~~ address the welfare aspects of layer pullets or laying hens kept in cage or non-cage systems, whether indoors or outdoors.

Commercial layer pullet or laying hen production systems include:

1. ~~Indoor~~ Completely housed systems

   Layer ~~P~~pullets or laying hens are completely confined in a poultry house, with or without mechanical environmental control ~~and with no designated outdoor area~~.

2. ~~Outdoor~~ Partially housed systems

   Layer ~~P~~pullets or laying hens are kept in ~~premises~~ a poultry house with ~~or without mechanical environmental control but have~~ access to ~~that include~~ a designated outdoor area.

3. Completely outdoor systems

   Layer ~~P~~pullets or laying hens are not confined inside a poultry house during the day but are confined in a designated outdoor area.

This chapter should be read in conjunction with Chapters 6.5., 7.1., 7.2., 7.3., 7.4., 7.5. and 7.6.

Annex 12 (contd)

Article 7.Z.3.

Outcome-based c~~C~~riteria (or measurables) for the welfare of layer pullets and ~~or~~ laying hens

The welfare of layer pullets and ~~or~~ laying hens should be assessed using outcome-based criteria or measurables, ~~specifically~~ preferably animal-based measurables, as described in Article 7.1.4. ~~Consideration should also be given to the resources provided and the design of the system. Outcome-based measurables, specifically animal-based measurables, can be useful indicators of *animal welfare*.~~ Outcome-based criteria or measurables are particularly useful for evaluating compliance and improving *animal welfare*. Animal-based outcomes are usually the most sensitive measurables (e.g. mortality rate). However, resource and management-based outcomes can also have important applications (e.g. interpretation of mortality rate data may be informed by decisions made to euthanise). There is no one single measurable that addresses all aspects of *animal welfare*. The use of ~~these~~ measurables ~~indicators~~ and the appropriate thresholds should be adapted to the different situations ~~where~~in which layer pullets and laying hens are kept~~managed~~, also taking into account the genetics used, ~~strain of bird concerned~~,~~.~~ ~~Consideration should also be given to the~~ resources provided ~~as well as~~, and the design and management of the system. Animal-based criteria or measurables can be considered as tools to monitor and refine these factors.

Criteria (or measurables) that can be ~~measured~~ used at ~~in~~ ~~the~~ farm level ~~setting~~ include ~~behaviour, body and plumage condition, egg shell condition, mortality and morbidity rates, bone and foot problems, etc. together with other factors such as genetics and environment~~. ~~The age at which abnormalities of these criteria are observed can help to determine the origin causation of potential problems. Other conditions such as bone and foot problems, disease, *infection* or *infestation* can also be assessed at depopulation or during routine sampling. It is recommended that values for welfare measurables be determined with reference to appropriate national, sectorial or regional standards for pullets or hens.~~ ~~C~~conditions such as ~~bone~~ skeletal and foot problems, disease and *infection* or *infestation* that can be assessed during routine or targeted ~~sampling~~ *monitoring*, or at depopulation. It is recommended that target values or thresholds for *animal welfare* measurables be determined by taking into account ~~with reference to~~ current scientific knowledge and appropriate national, sectorial or regional ~~standards~~ recommendations for layer pullets or laying hens. Determining the age and stage of production at which problems are detected may help to determine the cause.

The following animal-based and outcome-based ~~criteria and measurables~~measurables, in alphabetical order, ~~are~~ may ~~can~~ be useful indicators of layer pullet or laying hen welfare:

1. Beak condition

   Evaluation of beak condition provides useful information about the extent to which layer pullets and laying hens are able to engage in normal behaviour, such as foraging, feeding, drinking and preening [Dennis and Cheng, 2012; Vezzoli *et al*., 2015]. Tools for assessing beak condition have been developed and implemented in *animal welfare* assessment programmes [e.g. Kajlich *et al*., 2016].

~~1~~2. Behaviour

   The presence or absence of certain ~~chicken~~ behaviours may ~~could~~ indicate either good *animal welfare* or an *animal welfare* problem, such as ~~including~~ fear, pain or sickness. ~~In addition, chickens have evolved behaviours that they are highly motivated to perform and a good understanding of normal chicken behaviour [Nicol, 2015], including their social interactions [Estevez *et al*., 2007; Rodríguez-Aurrekoetxea, A. and Estevez, I., 2014], is required~~. Some behaviours may not be uniquely indicative of one type of problem; they may be exhibited for a variety of reasons. ~~The domestic fowl~~*Gallus gallus domesticus* has~~ve~~ evolved behaviours that they are ~~highly~~ motivated to perform and, a good understanding of their normal behaviour [Nicol, 2015], including their social interactions [Estevez *et al*., 2007; Rodríguez-Aurrekoetxea A. and Estevez I., 2014], is required for appropriate management and decision-making. Opportunities to display these behaviours are influenced by the physical and social environment [Widowski *et al*., 2016; Lay *et al*, 2011; O'Connor *et al*, 2011].

   a) Dust bathing

   Dust bathing is ~~an intricate~~ a complex behaviour providing body maintenance ~~behaviour~~ benefits. During dust bathing, layer pullets and laying hens~~birds~~ remove ~~work~~ loose substrate material, such as litter, through their feathers. This behaviour helps remove stale lipids ~~dirt~~ [van Liere and Bokma, 1987] ~~and parasites~~; ~~[Martin and Mullen, 2012~~, which contributes to the maintenance of ~~maintaining~~ plumage condition;~~,~~ This ~~which in turn~~ helps to regulate ~~maintain~~ body temperature and protect against skin injury. Reduced dust bathing behaviour in the *flock* may indicate problems with ~~litter~~ substrate or range quality, such as the ~~litter~~ substrate or ground being wet or not friable [Olson and Keeling, 2005; Van Liere and Bokma, 1987]. The demonstration ~~presence~~ of complete sequences of dust bathing may ~~indicate good welfare~~ be associated with positive affect [Widowski and Duncan, 2000].

b) Fear behaviour

Fearful layer pullets and laying hens show high reactivity to various stimuli [Jones , 1987; Zeltner and Hirt, 2008] ~~. Fearfulness can lead~~ and this may result in traumatic injuries~~y~~ ~~, and~~ or suffocation if ~~when~~ the layer pullets ~~and~~ or laying hens~~birds~~ pile on top of~~, and sometimes suffocate,~~ one another. Fearful layer pullets and laying hens~~birds~~ may be less productive [Barnett *et al.*, 1992] and more prone to injurious feather pecking behaviour [~~Hass~~ de Haas *et al.*, 2014]. Methods have been developed for evaluating fearfulness [Forkman *et al.*, 2007], for example by observing layer pullet and laying hen behaviour when people, including ~~when~~ ~~while~~ *animal handlers,* walk through the ~~poultry house or~~ pullet~~s~~ and hen~~s~~~~bird~~ area of the poultry house [Jones, 1996; Waiblinger *et al* 2006 ~~Forkman *et al.*, 2007~~].

c) Feeding and drinking behaviour

~~Reduced~~ Changes in feeding or drinking behaviour can~~may~~ indicate management problems, including inadequate spaces for, or inappropriate placement of, feeders or drinkers, dietary imbalances, poor *feed* or water quality, or *feed* contamination [Garner *et al.*, 2012; Thogerson *et al.*, 2009a; Thogerson *et al.*, 2009b]. Feed~~ing~~ and water ~~drinking~~ intake ~~are~~ often ~~depresse~~d reduce when pullets or hens are ill~~,~~. ~~and~~ *Feed* or water intake may also ~~be reduced~~ change as a result of ~~during periods of~~ heat [Lara L. J. & Rostagno M. H., 2013; Lin H. *et al.*, 2006] ~~stress and increased~~ or ~~during~~ cold [Alves *et al.*, 2012] ~~[Garner et al, 2012; Thogerson et al, 2009a; Thogerson et al, 2009b]~~ stress.

d) Foraging ~~activity~~ behaviour

Foraging is a motivated behaviour [de Jong *et al.*, 2007, Nicol *et al.*, 2011]. Foraging is the act of searching for food, typically by ~~walking and~~ pecking or scratching the ~~litter~~ substrate~~;~~. R~~r~~educed foraging activity may~~could~~ suggest problems with ~~litter~~ substrate quality or the presence of conditions that decrease ~~pullets and hens~~~~bird movement~~ foraging ~~activity~~ability [Appleby *et al.*, 2004; Lay *et al.*, 2011; Weeks and Nicol, 2006]. When in the presence of an adequate substrate, laying hens spend a large amount of time foraging even when food is readily accessible [Weeks and Nicol, 2006]. ~~Frequent foraging bouts may indicate good welfare [Dawkins, 1989; Duncan and Hughes, 1972] and reduce the incidence of injurious feather pecking [Blokhuis, 1989]~~.

e) Injurious feather pecking and cannibalism

Injurious feather pecking can~~may~~ result in significant feather loss and ~~may~~ lead to cannibalism. Cannibalism is the tearing of the flesh of another layer pullet or lying hen ~~bird~~, and can result in severe injury or death. These behaviours can have multifactorial causes and be difficult to control [Nicol, 2018; Hartcher, 2016; Estevez, 2015; Nicol *et al.*, 2013; Rodenburg, 2013; Lambton, 2013; Newberry, 2004].

f) Locomotory~~tion~~ and comfort behaviours

~~Locomotorytion and comfort behaviours are important for the health of the pullets and hens, allowing, allow for skeletal, body and plumage development and their maintenance,. These behaviours and may include walking, running, leaping, turning, stretching legs and wings, wing flapping, feather ruffling and ,tail wagging, and preening [Dawkins and Hardie, 1989; Shipov *et al.*, 2010; Norgaard, 1990].~~

Layer pullets and laying hens may display a variety of locomotory and comfort behaviours, including walking, running, leaping, turning, stretching legs and wings, wing flapping, feather ruffling, tail wagging~~,~~ and preening [Bracke and Hopster, 2006; Harthcher and Jones,2017; Dawkins and Hardie, 1989; Shipov *et al.*, 2010; Norgaard, 1990]. Some of these behaviours have been shown to be important for skeletal, body and plumage development and maintenance. For example, walking and wing movements contribute to improved leg and wing bone strength [Knowles and Broom, 1990], and preening helps remove stale lipids from the skin [Vezzoli et al., 2015] and keeps the feathers flexible and intact [Shawkey et al., 2003].

~~Opportunities to display these behaviours are influenced by housing system and space [Widowski *et al.*, 2016; Lay *et al*, 2011].~~

Annex 12 (contd)

g) Nesting

Nesting is a ~~natural~~ ~~and~~ ~~highly~~ motivated behaviour that includes nest site selection, nest formation and egg laying [Cooper and Albentosa, 2003; Weeks and Nicol, 2006; Cronin *et al.*, 2012; Yue and Duncan, 2003]. Uneven nest box utilisation, delayed oviposition, increased pacing and egg laying outside the nest may be indicative of problems with environmental or social behavioural factors [Cronin *et al.*, 2012; Cooper and Appleby, 1996; Gunnarsson *et al.*, 1999; Yue and Duncan, 2003; Widowski *et al.*, 2013].

h) Perching

Perching is a ~~natural~~ ~~and~~ ~~highly~~ motivated behaviour. ~~Birds~~ Layer p~~P~~ullets and laying hens may seek elevation during the day; however, the motivation to seek elevation is particularly strong at night when pullets and hens select a site for resting or sleeping [EFSA, 2015]. Reduced perching behaviour in the *flock* may indicate problems with environmental factors, injuries or ~~and~~ pullet rearing experience [Janczak and Riber, 2015; Gunnarsson *et al.*, 1999].

i) Resting and sleeping

~~Sleeping, including slow-wave and fast-wave states, is a natural normal behaviour in pullets and hens, including slow-wave and fast-wave sleep states [Blokhuis, 1983]~~ Sleep is an adaptive state that allows animals to recover from daily stress, conserve energy and consolidate memory [Siegel, 2009]. Layer p~~P~~ullets and laying hens display ~~highly~~ synchronised resting and sleeping behaviours, which can be disrupted by light intensity, photoperiod, environmental or social factors [Malleau *et al.*, 2007; Alvino *et al.*, 2009].

~~*j*~~*i)* Social behaviour

Pullets and hens~~Chickens~~ are ~~a~~ ~~highly~~ social ~~species~~ and~~,~~ engage~~ing~~ in synchronised behaviour [Olsson *et al.*, 2002; Olsson and Keeling, 2005]. ~~Benefits include social learning, protection from predators [Newberry *et al.*, 2001], aiding help in thermoregulation and plumage maintenance.~~ Social behaviour may differ according to the characteristics of the social environment [Estevez *et al.*, 2002; 2007]. Problems in social behaviour can be assessed using scoring systems for measuring the degree of damage caused by aggression ~~damage~~ and competition for resources [Estevez *et al.*, 2002; Blatchford *et al.*, 2016].

~~*j*~~*k)* Spatial distribution

Uneven spatial distribution of ~~the~~ ~~birds~~ layer pullets and laying hens may indicate fear reactions, thermal discomfort or, uneven availability or use of resources such as light, ~~food~~ *feed* or water, shelter, nesting ~~and~~ areas or comfortable resting locations [Rodríguez-Aurrekoetxea and Estevez, 2016; ~~Cornetto and Estevez, 2001~~; Bright and Johnson, 2011].

~~*k*~~*l)* Thermoregulatory behaviour

Prolonged or excessive panting and wing spreading are observed during heat stress [Mack, 2013; Lara and Rostagno, 2013]. Indicators of cold stress include feather ruffling, rigid posture, trembling, huddling and ~~piling on top of each~~ ~~other and~~ distress vocalisations.

~~*l*~~*m)* Vocalisation

Vocalisation can indicate emotional states, both positive and negative. A good understanding of *flock* vocalisations and their causes is useful for good *animal welfare* ~~care~~ [Zimmerman *et al.*, 2000; Bright, 2008; Koshiba *et al.*, 2013].

~~2~~3. Body condition

Poor body condition is reflective of ~~poor~~ *animal welfare* ~~outcomes~~ problems for individual ~~birds.~~ layer pullet and laying hens. At *flock* level, uneven body condition may be an indicator of ~~potential~~ poor *animal welfare* ~~problems~~. Body condition can be evaluated using on-farm sampling methods for body weight or body condition scores [Gregory and Robins, 1998; Craig and Muir, 1996, Elson and Croxall, 2006; Keeling *et al.*, 2003]. The choice of sampling methods should take into account the fact that feather cover ~~that~~ can mask actual body condition.

~~3~~4. Eye conditions

Conjunctivitis can indicate disease or the presence of irritants such as dust and ammonia. High ammonia levels can also cause corneal burns and eventual blindness. Abnormal eye development can ~~may~~ be associated with very low light intensity (<5 lux) [Jenkins *et al.*, 1979; Lewis and Gous, 2009; Prescott *et al.*, 2003].

~~4~~5. Foot problems

Hyperkeratosis, ~~and~~ bumblefoot, contact dermatitis, excessive claw growth, broken claws and toe injuries are painful conditions associated with, amongst other things, inappropriate flooring, poorly designed perches, ~~or~~ poorly maintained ~~litter~~ substrate [EFSA, 2005; Lay *et al.*, 2011; Abrahamsson and Tauson, 1995; Tauson and Abrahamson, 1996; Abrahamsson and Tauson, 1997] and inadequate ~~system~~ maintenance of aspects of the production system.

~~Excessive claw growth, broken claws and toe injuries affect locomotion and may be associated with pain [EFSA, 2005].~~

~~Contact dermatitis affects skin surfaces that have prolonged contact with wet litter, manure or other wet flooring surfaces [Tauson and Abrahamson, 1996].~~

~~Foot problems are usually manifested as blackened skin progressing to erosion and fibrosis on the lower surface of the footpads and at the back of the hocks.~~ If severe, the foot and hock ~~lesions~~ problems may contribute to locomotion problems and lead to secondary *infections.* Scoring systems for foot problems have been developed [Blatchford *et al.*, 2016].

~~5~~6. Incidence of diseases, infections, metabolic disorders and infestations

Ill-health, regardless of the cause, is an *animal welfare* concern~~,~~ and may be exacerbated by poor environmental or husbandry management.

~~6~~7. Injury rate and severity

Injuries are associated with pain and risk of infection. ~~The rate and severity of injuries can indicate health and welfare problems, in the *flock* during production,~~ They can be a consequence of the actions of ~~Injuries include those caused by~~ other ~~birds~~ pullets and hens (e.g. scratches, feather loss or wounding), management (e.g. nutritional deficits leading to skeletal problems), ~~by~~ environmental conditions~~,~~ (e.g. fractures and keel bone deformation), genetics used ~~and~~ or ~~by~~ human interventions (e.g. during handling and catching). It is important to assess both the rate and severity of injuries.

~~7~~8. Mortality, culling and morbidity rates

Daily, weekly and cumulative mortality, culling and morbidity rates should be within expected ranges. Any unforeseen increase in these rates ~~could~~ may reflect an *animal welfare* problem. Recording and evaluating causes of morbidity and mortality can be useful aids in diagnosing and remediating *animal welfare* problems.

~~8~~9. Performance indicators

Daily, weekly and cumulative performance should be within expected ranges. Any unforeseen reduction ~~decreases~~ in these rates ~~could~~ may ~~be reflective of~~ reflect an *animal welfare* ~~status~~ problem. Types of measures that can be used include:

a) ~~P~~pullet growth rate, which measures average daily mass gain per ~~average~~ pullet and *flock* uniformity;

b) ~~P~~pullet feed conversion, which measures the quantity of *feed* consumed by a *flock* relative to the total live mass produced, expressed as the mass of *feed* consumed per unit of body mass;

c) ~~H~~hen feed conversion, which measures ~~the~~ quantity ~~mass~~ of *feed* consumed by a *flock* relative to the unit of egg production;

d) ~~E~~egg production, ~~such as when~~ which measures ~~by e.g.~~ the number and size of eggs per hen housed;

Annex 12 (contd)

e) ~~E~~egg quality and downgrades, ~~such as when~~ which can be measured by, for example, grade percentage, shell strength ~~and~~, Haugh units, abnormalities and mis-laid or floor eggs;

~~9~~10. Plumage condition

Evaluation of ~~the~~ plumage condition ~~of pullets and hens~~ provides useful information about aspects of *animal welfare* in terms of feather pecking and cannibalism, ability to thermoregulate, illness, and protection from injury ~~Feather loss and damage can result from injurious feather pecking behaviour, nutritional problems, external parasites and abrasions resulting from faults in the equipment housing system~~ [Rodriguez-Aurrekoetxea and Estevez, 2016; Drake *et al.*, 2010]. Dirty ~~P~~plumage ~~dirtiness~~ may be associated with illness, ~~the~~ environmental conditions ~~and~~ or ~~production~~ the layer pullet and laying hen housing system. Plumage cover and cleanliness scoring systems have been developed for these purposes [Blokhuis, 2007; Blatchford *et al.*, 2016].

~~10~~11. Water and feed consumption

Monitoring and evaluating daily water and *feed* consumption is a useful tool ~~to~~ which may indicate thermal stress, disease, *infection* or *infestation* and other welfare conditions, taking into consideration ambient temperature, relative humidity and other related factors. ~~Problems with the water or feed quality and supply can result in~~ Changes in intake, crowding at feeders and drinkers and wet ~~litter~~ substrate ~~and diarrhoea, dermatitis, dehydration, changes in egg quality or quantity, production and body condition~~ may be associated with problems with the ~~water or feed~~ quality or supply of water, or *feed*.

Article 7.Z.4.

Recommendations for layer pullets and laying hens

Ensuring good welfare of layer pullets and laying hens is contingent upon several management factors, ~~including~~ such as system design, environmental management practices, and animal management practices including responsible husbandry and provision of appropriate care, and the genetics used. Serious problems can arise in any system if one or more of these elements are lacking. Although pullets and hens can adapt to a range of thermal environments, particularly if appropriate breeds and housing are used for the anticipated conditions, sudden fluctuations in temperature can cause heat or cold stress.

Articles 7.Z.5. to 7.Z.29. provide recommendations for ~~measures applied to~~ layer pullets and laying hens.

Each recommendation ~~in Article 7.Z.5. to 7.Z.29.~~ includes a list of relevant ~~animal~~outcome-based criteria ~~and~~ or measurables derived from Article 7.Z.3. and when appropriate. ~~This does not exclude~~ other criteria ~~and~~ or measurables ~~being used where or when appropriate~~. The suitability of some of these criteria ~~and~~ or measurables ~~will~~ should be determined ~~by~~ in accordance with the system in which the pullets and hens are housed.

~~Each recommendation includes a list of relevant outcome-based measurables derived from Article 7.Z.3. This does not exclude other measures being used when appropriate.~~

Article 7.Z.5.

Location, design, construction and equipment of establishments

The location of layer pullet~~s~~ and laying hen *establishments* should ~~be chosen to~~ be safe from the effects of fires and floods and other natural disasters to the extent practicable. In addition, *establishments* should be located or designed to avoid or minimise disease risks~~,~~ and exposure of layer pullets and laying hens to chemical and physical contaminants, noise and adverse climatic conditions.

Good welfare outcomes for layer pullets and ~~pullet~~ laying hens can be achieved in a range of housing systems. ~~Pullet and layer h~~Houses, outdoor areas and accessible equipment should be designed~~,~~ after ~~consideration of~~ considering ~~bird~~ the opportunities for layer pullets and laying hens ~~for pullets and hens~~ to perform ~~highly~~ motivated behaviours ~~(e.g. perching and nesting)~~, ~~and~~ as well as health, environmental factors, and animal management capability. ~~to promote good *animal welfare* and~~ They should also be maintained to avoid injury or discomfort ~~pain to the birds~~. Pullet and ~~layer~~ hen houses should be constructed with materials ~~and~~, electrical and fuel installations that minimise the risk of fire and other hazards, and are easy to clean and maintain. Producers should have a maintenance programme in place, including record-keeping for all equipment and contingency plans to address~~, the~~ failures ~~of~~ that could jeopardise ~~bird~~ layer pullets and ~~hen~~ laying hens welfare.

~~Producers should have a maintenance programme in place for all equipment and contingency plans in place to deal with, the failures of which could jeopardise bird pullet and hen welfare.~~

~~Outcome~~~~Animal~~Outcome-based measurables include: body condition ~~weight~~, culling and morbidity rates, fear behaviour, feeding~~,~~ and drinking behaviour, foot problems, ~~and~~ foraging behaviour ~~activity~~, ~~foot problems,~~ incidence of diseases, *infections* and *infestations*, injury rates and severity, locomotory~~ion~~ and comfort behaviours, mortality rates, performance indicators, plumage condition, ~~body condition weight,~~ , resting and sleeping, social behaviour and spatial distribution, thermoregulatory behaviour~~,~~ and vocalisations.

Article 7.Z.6.

Matching the layer pullets and laying hens with the housing and production system

Animal w~~W~~elfare and health considerations should balance any decisions on performance when choosing the genetics to be used ~~a layer strain~~ for a particular location, housing and production system. The pullet rearing system should pre-adapt ~~prepare~~ the bird for the intended ~~layer~~ production system [Aerni *et al.*, 2005].

~~Outcome~~~~Animal~~Outcome-based measurables include: dust bathing, feeding~~,~~ and drinking behaviours, foraging behaviour ~~activity~~, incidence of diseases, *infections* and *infestations*, injurious feather pecking and cannibalism, injury rate and severity, locomotory~~ion~~ and comfort behaviours, mortality rate, nesting, ~~*infestations*,~~ perching, performance indicators, plumage condition, resting and sleeping, social behaviour, and spatial distribution.

Article 7.Z.7.

~~Stocking density~~ Space allowance

Layer p~~P~~ullets and laying hens should be housed with ~~at~~ a space allowance ~~stocking density~~ that allows them to have adequate access to resources and to adopt normal postures. Providing sufficient space for the expression of locomotory~~ion~~ and comfort behaviours that contribute to good musculoskeletal health and plumage condition is desirable. Problems with space allowance may increase stress and the occurrence of injuries.

The following factors, in alphabetical order, should be ~~taken into account~~ considered when determining space allowance:

– age and mass of layer pullets and laying hens,

– ambient conditions,

– ~~housing design system,~~

– *biosecurity* strategy,

– equipment selection,

– *feed* and watering systems,

– ~~litter~~ flooring substrate,

– genetics~~;~~.

Annex 12 (contd)

– housing design,

– management capabilities,

– production system,

– usable space,

– ventilation.

– genetics strain,

– age and bird mass.

OutcomeAnimalOutcome-based measurables include: dust bathing, feeding and drinking behaviour and foraging, foraging behaviour activity, feeding, incidence of diseases, *infections* and *infestations*, injury rate and severity, locomotoryion and comfort behaviours, mortality rate, nesting, perching, performance indicators, plumage condition, resting and sleeping, social behaviour, and spatial distribution.

Article 7.Z.8.

Nutrition

Layer pPullets and laying hens should always be fed a diet appropriate to their age, production stage, and geneticsstrain, which contains adequate nutrients to meet their requirements for good health and welfare. The form of the *feed* should be acceptable to the layer pullets and laying hens and contain adequate nutrients to meet requirements for good *animal welfare* and health. *Feed* and water should be free from contaminants, debris and microorganisms or other potential *hazards*.

The form and quality of feed and water should be acceptable to the birds and free from contaminants, debris and microorganisms hazardous to bird health.

The feeding and watering systems should be inspected regularly and cleaned, as needed, regularly to prevent the growth of hazardous microorganisms.

Birds Layer pPullets and laying hens should be provided with adequate access to *feed* on a daily basis. Water should be continuously available except under veterinary advice. Special provisions should be made to enable newly hatched pullets chicks to access appropriate *feed* and water.

OutcomeAnimalOutcome-based measurables include: aggression, body condition, performance (egg quality), water and feed consumption, foraging activity behaviour, incidence of disease, *infections* and *infestations*, injurious feather pecking, injury rate and severity, metabolic disorders, mortality rate, performance, plumage condition, vocalisations, and water and *feed* consumption.

Article 7.Z.9.

Flooring

The flooring for the birds should be easy to clean and disinfect and not cause harm or damage to them.

The slope, and design and construction of the floor should allow birds pullets and hens to express normal locomotoryion and comfort behaviours. The slope, design and construction of the floors should provide adequate support for the locomotion of for the layer pullets and laying hensthe birds adequately, prevent injuries, and entrapments, and ensure good health and allow the performance of normal behaviourthat manure does not contaminate other birds pullets and hens. Changes of flooring types from pullet to layer hen housing should be avoided. Manure contamination from other layer pullets and laying hens within the house should be minimised through appropriate floor design and other elements of system design. The flooring should be easy to clean and disinfect and should not cause harm.

~~The provision of loose and dry litter material is desirable to encourage dust bathing and foraging by pullets and hens. When litter is provided it should be managed to minimise any detrimental effects on welfare and health.~~ When litter is provided, ~~Litter~~it should be managed to remain dry and friable, ~~replaced or~~ and adequately treated or replaced when required to prevent diseases and minimise any detrimental effects on *animal welfare*~~, *infections* and *infestations*~~.

~~Outcome~~~~Animal~~Outcome-based measurables include: ~~comfort behaviour,~~ dust bathing, foot problems, foraging behaviour ~~activity~~, incidence of diseases, *infections* and *infestations*, injury rates and severity, locomotory~~ion~~ and comfort behaviours, performance, plumage condition and~~,~~ resting and sleeping.

Article 7.Z.10.

Dust bathing areas

Access to ~~The provision of~~ friable, dry ~~litter~~ substrate ~~material is desirable~~ to encourage dust bathing is desirable ~~by pullets and hens~~. ~~When d~~~~D~~When provided, dust bathing areas ~~are offered, they~~ should be ~~provide suitable friable materials,~~ designed and positioned to encourage dust bathing, allow synchronised behaviour, prevent undue competition and not cause damage or injuries. Dust bathing areas should be easy to inspect and maintain ~~clean~~ ~~[Lentfer *et al.*, 2011]~~ [Weeks and Nicol, 2006].

~~Outcome~~~~Animal~~Outcome-based measurables include: dust bathing, incidence of diseases, *infections* and *infestations*, injury rate and severity, plumage condition and~~,~~ spatial distribution.

Article 7.Z.11.

Foraging areas

~~The provision of~~ Access to substrate that ~~friable, dry litter material is desirable to~~ encourages foraging behaviour activity is desirable. When provided, ~~When F~~foraging areas ~~are offered, they~~ should ~~provide suitable materials, and~~ be designed and positioned to encourage ~~foraging activity, allow~~ synchronised behaviour, prevent undue competition and not cause damage or injuries. Foraging areas should be easy to inspect and maintain ~~clean~~.

~~Outcome~~~~Animal~~Outcome-based measurables include: foraging behaviour ~~activity~~, incidence of diseases, *infections* and *infestations*, injurious feather pecking and cannibalism, injury rate and severity~~,~~ and spatial distribution.

Article 7.Z.12.

Nesting areas

Access to ~~When n~~~~N~~nesting areas is desirable. When ~~should be~~ provided ~~are offered,~~ nesting areas~~they and should~~ should be built of suitable materials, and designed and positioned to encourage nesting, prevent undue competition and not cause damage or injuries. Nesting areas should be easy to inspect, clean and maintain~~disinfect~~.

~~Outcome~~~~Animal~~Outcome-based measurables include: ~~injurious feather pecking and cannibalism,~~ incidence of diseases, *infections* and *infestations*, injurious feather pecking and cannibalism, injury rate and severity, nesting, performance~~,~~ (mis-laid or floor eggs), and spatial distribution.

Article 7.Z.13.

Perches

Access to ~~When p~~~~P~~perches is desirable. When ~~should be~~ provided ~~are offered~~, ~~they and~~ perches ~~should~~ should be built of suitable materials, designed, elevated and positioned to encourage perching by ~~for~~ all layer pullets and laying hens, prevent undue competition, ~~to prevent~~ minimise keel bone deformation ~~or~~, foot problems or other injuries~~harms~~, and to ensure ~~maintain~~ stability ~~of the birds~~ during perching. In the absence of designated perches, other structures such as platforms, grids or ~~and~~ slats that are perceived by the pullets and hens ~~birds~~ as elevated and that do not cause damage or injuries, may be a suitable alternative. When provided, p~~P~~erches or their alternatives should be made available from an early age, be easy to clean and maintain,~~disinfect~~ and be positioned to minimise faecal fouling [Hester, 2014; EFSA, 2015].

Annex 12 (contd)

~~Perch elevation should be carefully considered to minimise injurious feather pecking, cannibalism, keel deformities and fractures.~~

~~Outcome~~~~Animal~~Outcome-based measurables include: foot problems, injurious feather pecking and cannibalism, injury rate and severity, perching, plumage condition, resting and sleeping~~,~~ and spatial distribution.

Article 7.Z.14.

Outdoor areas

Layer p~~P~~ullets and laying hens may~~can~~ be given access to outdoor areas ~~as soon as~~ when they have sufficient feather cover and ~~are old enough to~~ can range safely. Where pullets and hens are partially housed, ~~T~~there should be sufficient appropriately designed ~~exit areas~~ openings to allow them to leave and re-enter the poultry house freely.

Management of outdoor areas is important. Land and pasture management measures should be taken to reduce the risk of ~~birds~~ layer pullets and laying hens becoming infected by pathogenic agents~~,~~ or infested by parasites or being injured. This may~~might~~ include limiting the stocking density or using several pieces of land consecutively in rotation.

Outdoor areas should be located on well-drained ground and managed to minimise ~~swampy conditions~~ ~~standing~~ stagnant water and mud. The outdoor area should be able to contain the ~~P~~layer-pullets and laying hens ~~birds~~ and prevent them from escaping. Outdoor areas should be designed, built and maintained to allow layer pullets and laying hens to feel safe outdoors and to ~~be~~ encourage~~d~~ them to ~~optimise~~ ~~optimally~~ ~~utilisation~~ utilise ~~of~~ the range optimally, while mitigating predation, ~~and~~ disease risks, and adverse climatic conditions [Gilani *et al.*, 2014; Hegelund *et al.*, 2005; Nagle and Glatz, 2012]. Pullets and ~~H~~hens should be habituated early to the outdoor area [Rodriguez–Aurrekoetxea and Estevez, 2016]. Outdoor areas should ~~provide shelter for the birds and~~ be free from ~~poisonous~~ harmful plants and contaminants.

~~Outcome~~~~Animal~~Outcome-based measurables include: fear behaviour, foot problems, foraging behaviour ~~activity~~, incidence of diseases, *infections* and *infestations*, injury rate and severity, locomotory~~ion~~ and comfort behaviours, morbidity and ~~rate,~~ mortality rates, ~~*infestations,*~~ performance, plumage condition, social behaviour, spatial distribution, thermoregulatory behaviour~~,~~ and vocalisation.

Article 7.Z.15.

Thermal environment

Thermal conditions for layer pullets and laying hens should be maintained within a range that is appropriate for their stage of life~~,~~ and the genetics used~~,~~; ~~and~~ extremes ~~of~~ heat, humidity and cold should be avoided. A heat index can assist in identifying the thermal comfort zones for ~~the~~ layer pullets and laying hens at varying temperatures, air velocity~~ies~~ and relative humidity levels [Xin and Harmon, 1998], and can be found in management guidelines provided by laying hen genetics companies ~~and can be found in management guidelines provided by primary laying hen genetics companies [Xin and Harmon, 1998]~~.

When environmental conditions move outside of these zones, strategies should be used to mitigate ~~against~~ the adverse effects on the layer pullets and laying hens ~~birds~~. These may include adjusting air speed, provision of heat or evaporative cooling [Yahav, 2009].

~~Control of t~~The thermal environment should be monitored ~~frequently~~ regularly ~~enough~~ so that failure of the system can be ~~noticed~~ detected and corrected before they ~~it~~ cause~~s~~ ~~an~~ *animal welfare* problem~~s~~.

~~Outcome~~~~Animal~~Outcome-based measurables include: morbidity rate, mortality rate, performance, spatial distribution, temperature and humidity, thermoregulatory behaviours~~,~~ and water and *feed* consumption.

Article 7.Z.16.

Air quality

Ventilation, housing, space allowance and manure management can affect air quality. Actions are required to maintain air quality at levels required for good *animal welfare* ~~at all times~~, including the removal or mitigation of noxious ~~of waste~~ gases such as carbon dioxide and ammonia, dust and excess moisture ~~content from~~ in the environment.

~~The a~~Ammonia concentrations should not routinely exceed 25 ppm at ~~bird~~ layer pullet and laying hen level [David *et al.*, 2015; Miles *et al.*, 2006; Olanrewaiu, 2007].

Dust levels should be kept to a minimum [David *et al.*, 2015]. ~~Where the health and welfare of birds depend on an artificial ventilation system, provision should be made for an appropriate back-up power and alarm system.~~

~~OutcomeAnimal~~Outcome-based measurables include: ammonia level, carbon dioxide level, dust level, eye conditions, incidence of ~~respiratory~~ diseases, *infections*, metabolic disorders and *infestations*, morbidity and mortality rates, plumage condition, performance indicators, temperature and humidity and thermoregulatory behaviours.

Article 7.Z.17.

Lighting

There should be an adequate period of continuous light. The light intensity during the light period should be sufficient and homogeneously distributed to promote ~~for~~ normal development ~~of the birds~~, allow layer pullets and laying hens to ~~for~~ find~~ing~~ *feed* and water, to stimulate activity, to stimulate onset of lay, minimise the likelihood of feather pecking and cannibalism, and to allow adequate inspection [Prescott *et al.*, 2003; Prescott and Wathes, 1999; Green *et al.*, 2000].

There should also be an adequate period of ~~light and~~ darkness during each 24-hour cycle to allow layer pullets and laying hens ~~the birds~~ to rest and sleep, to reduce stress~~,~~ and ~~to~~ promote circadian rhythms [Malleau *et al.*, 2007].

~~When c~~Changes in lighting should occur gradually or ~~are needed, they should be performed~~ in a step-wise fashion, as needed, except during induced moulting ~~(if practised)~~ when rapid adjustments to lighting should be considered ~~are desired~~ [Tanaka and Hurnik, 1990; Kristenson, 2008].

~~Outcome~~~~Animal~~Outcome-based measurables include: eye conditions, injurious feather pecking and cannibalism, injury rate and severity, locomotory~~ion~~ behaviour, nesting, perching, performance, plumage condition, resting and sleeping~~,~~ and spatial distribution.

Article 7.Z.18.

Noise

Although ~~P~~layer pullets and laying hens ~~are~~ can adapt~~able~~ to different levels and types of noise.~~;~~ ~~However, e~~~~E~~exposure of ~~birds~~ layer pullets and laying hens to unfamiliar noises, particularly those that are sudden or loud, should be minimised ~~wherever possible~~ to prevent stress and fear reactions , such as piling up [Bright and Johnson, 2001]. Ventilation fans, machinery ~~or~~ and other indoor or outdoor equipment should be constructed, placed, operated and maintained in such a way ~~that it~~ as to causes the least possible amount of noise [Chloupek *et al.*, 2009].

Location of *establishments* should, where possible, ~~take into account~~ consider existing local sources of noise. Strategies should be implemented to acclimatise ~~to habituate~~ the ~~birds~~ layer pullets and laying hens to the conditions [Candland *et al.*, 1963; Morris, 2009].

~~Outcome~~~~Animal~~Outcome-based measurables include: fear behaviours, injury rate and severity, mortality rate, performance indicators, resting and sleeping, and vocalisation.

Annex 12 (contd)

Article 7.Z.19.

Prevention and control of injurious feather pecking and cannibalism

Injurious feather pecking and cannibalism are challenges in pullet and hen production systems.

Management methods that may reduce the risk of occurrence include:

– managing light in rearing and lay [Nicol *et al.*, 2013; van Niekerk *et al.*, 2013],

– adapting the diet and form of *feed* during rearing and lay [Lambton *et al.*, 2010],

– choosing genetics strain with a low propensity to for injurious feather pecking [Craig and Muir, 1996; Kjaer and Hocking, 2004],

– influencing increasing age of at onset of lay [Green *et al.*, 2010 Pötzsch, 2001],

– reducing stocking density [Zimmerman et al., 2006]; increasing space allowance during rearing [Jung and Knierim, 2018],

– managing light in during rearing and lay [Nicol *et al.*, 2013; van Niekerk *et al.*, 2013],

– minimising fear-related stimuli [Uitdehaag K. A. *et al.*, 2009],

– treating beaks in chicks [Gentle and Hughes, 1997], especially by using new non-invasive beak treatments that are being developed,

– providing elevated perches duringin rearing and lay [Green *et al.*, 2000],

– adapting diet and form of feed in rearing and lay [Lambton *et al.*, 2010],

– providing foraging or other manipulable materials in during rearing and lay [Huber-Eicher and Wechsler, 1998; de Jong *et al.*, 2010; Daigle *et al.*, 2014; Dixon *et al.*, 2010; Nicol, 2018],

– reducing group size in during rearing and lay [Bilcik and Keeling, 1999].

– introducing males [Bestman and Wagenaar, 2003].

These mManagement methods should be to control the occurrence include the above listimplemented, where applicable, and in the event of injury prompt removal of affected layer pullets and laying hensbirds should be promptly removed and treated to a hospital area or euthanasedia.

If these management strategies methods are unsuccessfulfail, therapeutic partial beak removal treatment [Gentle et al., 1997], trimming is the last resort. may be considered as a final course of action.

OutcomeAnimalOutcome-based measurables include: injurious feather pecking and cannibalism, injury rate and severity, mortality and culling rate, plumage condition, and vocalisation.

Article 7.Z.20.

Moulting

Induced moulting can lead to *animal welfare* problems if not well managed [Nicol *et al.*, 2017; Sariozkan *et al.*, 2016; Holt, 2003, Ricke, 2003, Webster, 2003]. When induced moulting is practised, techniques methods that do not involve withdrawal of *feed* should be used and are consistent with Article 7.Z.8. should be used. Laying hHens should have access to lights and access to water at all times [Anderson, 2015]. Only laying hens in good body condition and health should be moulted. During the moulting period, body mass loss of body mass should not compromise the laying hen welfare, including welfare during the subsequent laying period. Total mortality and culling rates during the moult period should not exceed normal variations in *flock* mortality and culling rate.

OutcomeAnimalOutcome-based measurables include: body condition, feeding and drinking, foraging behaviour activity [Biggs *et al.*, 2004; Saiozkan *et al.*, 2016; Petek and Alpay, 2008], injurious feather pecking and cannibalism, injury rate and severity, morbidity rate, mortality and culling rate, performance, plumage condition, and social behaviour.

Annex 12 (contd)

Article 7.Z.21.

Painful procedures ~~interventions~~

Painful procedures ~~interventions, such as beak treatmenttrimming,~~ should not be practised unless ~~absolutely~~ necessary and should be ~~pain mitigation interventions should be used~~ performed in such a way as to minimise any pain, distress and suffering. ~~Beak trimming at a mature age can cause chronic pain. Other mutilations (e.g. dubbing and toe trimming) should not be performed in pullets and hens. Pain-free alternatives should be favoured are preferred~~. If used, partial ~~preventive~~ beak removal ~~treatment trimming~~ should be carried out ~~by trained and skilled personnel~~ at the earliest age possible and care should be taken to remove the minimum amount of beak necessary using a method~~,~~ ~~which~~ that minimises pain and controls bleeding. ~~Current methods include infrared treatment or hot blade cutting. Beak trimming at a mature age can cause chronic pain~~ If management ~~strategies~~ methods to control injurious feather pecking and cannibalism are not successful ~~fail~~, therapeutic partial beak ~~treatment~~ removal may be considered as a final course of action [Gentle *et al.*, 1991; Marchand-Forde *et al.*, 2008; Marchand-Forde *et al.*, 2010; McKeegan and Philbey, 2012; Freire *et al.*, 2011; Glatz *et al.*, 1998]. Partial beak removal at a mature age can cause chronic pain. ~~Other mutilations (e.g. dubbing and toe trimming) should not be performed in pullets and hens.~~ Dubbing, toe trimming and other mutilations should not be performed in layer pullets and laying hens.

Potential options for improving *animal welfare* in relation to these procedures include: ceasing the procedure, reducing or eliminating the need for the painful procedures through management strategies, using genetics that do not require the painful procedures, or replacing the current procedures with less painful or invasive alternatives.

~~Beak trimming at a mature age can cause chronic pain. If therapeutic beak trimming is required, at whatever age, it should be carried out by trained and skilled personnel and care should be taken to remove the minimum amount of beak necessary using a method which minimises pain and controls bleeding.~~

~~Outcome~~~~Animal~~Outcome-based measurables include: beak condition, body condition, feeding and drinking behaviour, ~~and~~ foraging behaviour ~~activity~~, ~~feeding~~, injurious feather pecking and cannibalism, locomotory and comfort behaviours, mortality rate, morbidity rate, performance, plumage condition~~,~~ and vocalisations.

Article 7.Z.22.

Animal health management, preventive medicine and veterinary treatment

Animal handlers responsible for the care of pullets and hens should have ~~be~~ knowledge ~~aware~~ of normal layer pullet and laying hen behaviour, ~~the~~ and be able to detect signs of ill-health or distress, such as a change in *feed* ~~and~~ or water intake, reduced production, changes in behaviour~~,~~ and abnormalities in plumage condition ~~appearance of feathers~~, faeces~~,~~ or other physical features.

If *animal handlers* are ~~not~~ unable to identify the cause of disease, ill-health or distress, or are unable to correct these, or if they suspect the presence of a *notifiable disease*, they should seek advice from a *veterinarian* or other qualified advisers. Veterinary treatments should be prescribed by a *veterinarian*.

There should be an effective programme for the prevention of diseases that is consistent with the programmes established by *Veterinary Services* as appropriate, and which includes record-keeping.

Vaccinations and treatments should be administered by personnel skilled in the procedures and with consideration for the welfare of the layer pullets and laying hens.

Sick or injured pullets and hens should be placed in a hospital area for observation and treatment, or ~~humanely killed~~ euthanised in accordance with Chapter 7.6. as soon as possible.

~~Outcome~~~~Animal~~Outcome-based measurables include: body condition, incidence of diseases, *infections*, metabolic disorders and *infestations*, injury rate and severity, ~~metabolic disorders and *infestations*,~~ morbidity rate, mortality rate~~,~~ and performance.

Annex 12 (contd)

Article 7.Z.23.

Biosecurity plans

Biosecurity plans should be designed, ~~and~~ implemented, and reviewed regularly, commensurate with the best possible layer pullet and laying hen~~birds~~ health status ~~and~~ . The *biosecurity plan* should be sufficiently robust to be effective in addressing the current disease *risks* ~~(endemic and exotic)~~ that ~~is~~ are specific to each epidemiological group of layer pullets and laying hens and in accordance with relevant recommendations in the *Terrestrial Code*.

These programmes should address the control of the major routes for *infection* and *infestation* such as:

~~–~~ ~~direct transmission from other *poultry*, domestic *animals* and *wildlife* and humans,~~

~~–~~ ~~*vectors* (e.g. arthropods and rodents),~~

– aerosols,

– direct transmission from other *poultry*, domestic *animals* and *wildlife* and humans,

– *feed*,

– fomites, such as equipment, facilities and vehicles,

~~–~~ ~~feed,~~

~~–~~ ~~the practice of partially restocking the house (back filling), due to catastrophe or incomplete *flock* placement, which should only be performed practiced with due consideration to *biosecurity* and in a manner that prevents commingling of *flocks*.~~

– *vectors* (e.g. arthropods and rodents),

– water supply.

Partially restocking (back filling), in a response to catastrophe or incomplete flock placement, should only be practised with due consideration to biosecurity and in a manner that prevents co-mingling of flocks.

~~Outcome~~~~Animal~~Outcome-based measurables include: culling and morbidity rates, incidence of diseases, ~~*infestations*~~, ~~morbidity rate~~ mortality rate~~, culling and morbidity rates~~, ~~mortality rate~~, and performance indicators.

Article 7.Z.24.

~~**Humane killing**~~ **Euthanasia of individual ~~birds or flocks~~ layer pullets or laying hens**

Individual ~~sick or injured~~ layer pullets or laying hens ~~requiring euthanasia~~ may be ~~should be humanely killed as soon as possible. When an individual or groups of pullets or hens birds are killed for~~ euthanasedsia ~~or humanely killed for diagnostic purposes, depopulation of end-of-lay *flocks* or for purposes of disease control~~, T~~the~~echniques used should be performed, ~~in a humane manner~~ in accordance with Chapter 7.6.

Reasons for euthanasia may include:

– disaster management,

– diagnostic purposes,

– rapid deterioration of a medical condition for which treatment has been unsuccessful,

– bone fractures or other injuries,

– emaciation,

– severe pain that cannot be alleviated.

The decision to euthanise an animal and the procedure itself should be undertaken by a competent person. The *establishment* should have documented procedures and appropriate equipment.

Outcome-based measurables include: injury rate and severity.

Article 7.Z.25.

Depopulation of pullet and ~~layer~~ hen facilities

This article refers to the removal of flocks of layer pullets and laying hens from facilities for whatever reason and should be read in conjunction with Article 7.Z.24.

~~Pullets and hens should not be subjected to an excessive~~ The period of *feed* withdrawal prior to ~~the expected~~ depopulation ~~time~~ of layer pullets and laying hens should be minimised.

Water should be available up to the time of depopulation.

~~Birds~~ ~~l~~Layer p~~P~~ullets and laying hens that are not fit for *loading* or transport ~~because they are sick or injured~~ should be euthanised ~~humanely killed~~. Hens with poor plumage condition are at risk of thermal stress and injury during transport [Broom, 1990; Fleming *et al.*, 2006; Gregory and Wilkins 1989; Newberry *et al.*, 1999; Webster, 2004; Whitehead and Fleming, 2000]. On-farm *killing* should be performed in accordance with Chapter 7.6.

Catching should be carried out by competent *animal handlers* in accordance with ~~the conditions of~~ Article 7.Z.28. and every attempt should be made to minimise stress, fear reactions and injuries~~y~~. If a layer pullet or laying hen~~bird~~ is injured during catching, it should be euthanised ~~humanely killed~~.

~~Birds~~ Layer p~~P~~ullets and laying hens should be handled and placed into the transport *container* in accord~~ing~~ance ~~to~~ with Chapter 7.3. ~~Article 7.Z.14.~~

Catching should preferably be carried out under dim or blue light to calm the ~~birds~~ layer pullets and laying hens.

Catching should be scheduled to minimise the transport time as well as climatic stress during catching, transport and holding.

The ~~S~~stocking density in transport *containers* should be in accordance ~~comply~~ with Chapters 7.2., 7.3. and 7.4.

~~Outcome~~~~Animal~~Outcome-based measurables include: fear behaviour, injury rate and severity, mortality rate ~~at depopulation and on arrival at the destination~~, spatial distribution, and vocalisation.

Article 7.Z.26.

~~Emergency~~ Contingency plans

Layer p~~P~~ullet and laying hen producers should have ~~emergency~~ contingency plans to minimise and mitigate the consequences of natural disasters, disease *outbreaks* and the failure of mechanical equipment. Planning should include a fire safety plan and, where relevant, ~~may~~ include the provision, maintenance and testing of backup generators and fail-safe alarm devices to detect malfunctions, ~~backup generators,~~ access to maintenance providers, alternative heating or cooling arrangements, ability to store water on farm, access to water cartage services, adequate on-farm storage of *feed* ~~and~~ an alternative *feed* supply~~, a fire safety plan~~ and a plan for managing ventilation emergencies.

The ~~emergency~~ contingency plans should be consistent with national programmes established or recommended by *Veterinary Services*. Humane emergency *killing* procedures should be a part of the plan and be in accordance ~~ing to~~ with the methods recommended in Chapter 7.6.

~~Outcome~~~~Animal~~Outcome-based measurables include: culling, morbidity and mortality rates.

Article 7.Z.27.

Competencies of p~~P~~ersonnel ~~competency~~

Animal handlers ~~responsible for the pullets and hens~~ should have the ability, knowledge and competencies necessary to maintain the welfare and health of the layer pullets and laying hens.

Annex 12 (contd)

All people responsible for layer pullets and laying hens should have received appropriate training~~,~~ and ~~or~~ be able to demonstrate that they are competent to carry out their responsibilities, which should include ~~and should have sufficient knowledge of~~ the assessment of pullet and hen~~bird~~ behaviour, handling techniques, *euthanasia* and *killing* ~~emergency killing~~ procedures, implementation of *biosecurity*, and the detection of general signs of diseases~~,~~ and indicators of poor *animal welfare* and procedures for their alleviation.

~~Outcome~~~~Animal~~Outcome-based measurables include: body condition, culling and morbidity rate, fear behaviour, incidence of diseases, locomotory~~ion~~ and comfort behaviours, performance, ~~morbidity rate,~~ mortality rate, ~~culling and morbidity rate~~spatial distribution~~,~~ and vocalisation.

Article 7.Z.28.

Inspection and handling

Layer p~~P~~ullets and laying hens, and the facilities and equipment within their poultry house~~premises~~ should be inspected at least daily. Inspection should have the following ~~three~~ ~~main~~ objectives: ~~to identify sick or injured birds to treat or cull them, to detect and correct any welfare or health problem in the *flock* and to pick up dead birds.~~

- ~~to identify sick or injured pullets and hens and to treat or cull kill them in accordance with Article 7.Z.24.;~~
- to ~~pick up~~ collect and remove dead layer pullets and laying hens, and dispose of them in accordance with Chapter 4.13.;
- to identify sick or injured layer pullets and laying hens, and treat or euthanased them in accordance with Article 7.Z.24.;
- to detect and correct any *animal welfare* or health problems in the *flock*; and
- to detect and correct malfunctioning equipment and other ~~facility~~ problems with the facility.
- ~~to identify sick or injured pullets and hens and to treat or cull kill them in accordance with Article 7.Z.24.;~~

Inspections should be done in such a way that ~~birds~~ layer pullets and laying hens are not unnecessarily disturbed, for example *animal handlers* should move quietly and slowly through the *flock*.

When layer pullets and laying hens are handled, particularly when ~~birds are~~ placed into or removed from the poultry house, they should not be injured, and should be held in ~~postures~~ a manner that minimises fear and stress ~~unnecessarily frightened or stressed~~ ~~(e.g. should be restrained in an upright posture)~~ [Gregory & Wilkins, 1989; Gross & Siegel, 2007; Kannan & Mench, 1996]. The distance ~~that~~ over which layer pullets and laying hens are carried should be minimised. Laying hens are prone to bone fractures when not handled properly.

Outcome~~Animal~~~~Outcome~~-based measurables include: culling and morbidity rates, fear behaviour, injury rate and severity, ~~morbidity rate,~~ mortality, ~~culling and morbidity rates,~~ performance, spatial distribution~~,~~ and vocalisation.

Article 7.Z.29.

Protection from predators

Layer p~~P~~ullets and laying hens should be protected from predators in indoor and outdoor areas. All production systems should be designed and maintained to prevent access by predators and *wild* birds.

Outcome~~Animal~~~~Outcome~~-based measurables include: culling and morbidity rates, fear behaviour, ~~mortality,~~ injury rate and severity, locomotory~~ion~~ and comfort behaviours, mortality rate, ~~culling and morbidity rates,~~ performance, spatial distribution~~,~~ and vocalisation.

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※本資料は参考仮訳ですので、最終的な確認は原文をご参照ください。

参考資料4（仮訳）

第７．Ｚ章（案）

アニマルウェルフェアと採卵鶏生産システム

第7.Z.1条

定義

本章の目的上、

採卵鶏~~（雌鶏）：~~人の消費用の卵の商用生産を目的として飼養されている、性的に成熟した雌の*Gallus gallus domesticus*種の鳥をいう。村落又は裏庭~~の*群れ*で~~飼育されている採卵鶏は除く。種鶏は含まれない除く。

採卵終期の雌鶏とは、~~：~~生産期の終期の採卵鶏をいう。

採卵若雌鶏~~（若雌鶏）：~~商用採卵鶏生産を目的として、孵化から性的成熟の開始まで飼養されている、雌の*Gallus gallus domesticus*種の鳥をいう。

第7.Z.2条

適用範囲

本章は、商用採卵鶏生産システムのウェルフェアの勧告を示す~~を扱う~~。*初生雛*が育成農場に到着してから、採卵終期の雌鶏を採卵鶏生産施設から移動するまでの生産期間を対象とする。村落又は裏庭で飼育され個人消費の卵生産に供されている採卵鶏は含まれないを除く。

商用採卵鶏生産システムには、採卵若雌鶏及び採卵雌鶏鳥の収容、*バイオセキュリティ*の適用及び卵又は若雌鶏の取引を含む。

これらの勧告は、屋内又は屋外であって、ケージ又はケージ以外のシステムで飼養されている採卵若雌鶏又は採卵雌鶏のウェルフェアに関する事項を対象とする。

商用採卵若雌鶏又は採卵雌鶏の生産システムには以下のものがある。

１．完全舎飼屋内型システム

採卵若雌鶏又は採卵雌鶏が、機械的な環境管理がある又はない形で、~~屋外専用の区域がなく、~~完全に鶏舎に収容される。