



Ref: VITT1200/H5N1 – Russia

**HIGHLY PATHOGENIC AVIAN INFLUENZA**  
**IN**  
**RUSSIA**

**Working Document: Version 1**

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## 1 Summary

Trade in unprocessed feathers of domestic poultry between western Russia and the UK is subject to EU rules which require official certification. The likelihood of introducing H5N1 virus to the UK from western Russia (the part of Russia adjacent to Europe) through legal trade in unprocessed feathers is considered negligible. This estimate is no greater than the likelihood of the introduction of disease from importing unprocessed feathers from any Third country that is not subject to HPAI or ND restrictions, and from which official certification is not required under EU rules.

The current estimate is based on the reported absence of H5N1 outbreaks in western Russia and the assumption that Russian authorities have reliable certification system for unprocessed feathers. This estimate is also supported by practical experience so far that no H5N1 outbreaks in birds (domestic or wild) have been attributed to imports of unprocessed feathers.

An outbreak of H5N1 in any trading country is of concern to the UK and the EU. Russia reports that the outbreaks of H5N1 have been confined to non-commercial village poultry, in six regions in southern Russia (the Asian part of Russia). These outbreaks have been subjected to eradication and no further outbreaks have been reported since mid-August 2005. There has been only one report of an H5N1 outbreak in a commercial poultry operation in southern Russia and this has been effectively eradicated.

According to the Russian veterinary authorities, there are no reports of disease outbreaks in commercial poultry operations outside the affected regions in southern Russia. That is, no outbreaks have been detected in western Russia. Nevertheless, IAHD will continue to monitor developments and will provide an update on the situation if required.

## **2 Introduction**

This qualitative risk assessment considers the likelihood of the introduction of Highly Pathogenic Avian Influenza (HPAI) H5N1 virus to the UK via legal trade in poultry or poultry products following the outbreaks of H5N1 virus in the southern part of Russia.

## **3 Hazard identification**

### **3.1 HPAI H5N1 outbreaks in Southern Russia – Official disease reports**

Outbreaks of HPAI H5N1 were reported in village poultry, in six regions in the southern part of Russia during July and August 2005 (OIE, 2005a). At that time, our qualitative risk assessment (Defra, 2005) concluded that there was a low likelihood of the introduction of H5N1 by imports of captive and pet birds, and unprocessed feathers from the whole territory of Russia. The Russian veterinary authorities consider that the outbreaks have been effectively contained in the affected regions in the Southern Russia. No further outbreaks of the disease within the affected region, or its spread into unaffected regions, have been detected since mid August 2005 (OIE, 2005a).

No outbreaks of the disease have been detected in western Russia (the part of Russia adjacent to Europe) (Nepoklonov, E.A.- presentation at the meeting of the EU CVOs, September 2005). Our previous assessment (Defra, 2005) concluded that the likelihood of disease introduction via imported unprocessed feathers from whole of Russia was low, therefore, trade in this commodity from whole of Russia was suspended. This conclusion has now been reviewed in the context of the most recent information presented by the Russian veterinary authorities that no cases of H5N1 have been detected in western Russia. Therefore, the likelihood for contamination of unprocessed feathers with HPAI H5N1 that may be imported from western Russia to the UK is assessed in this document.

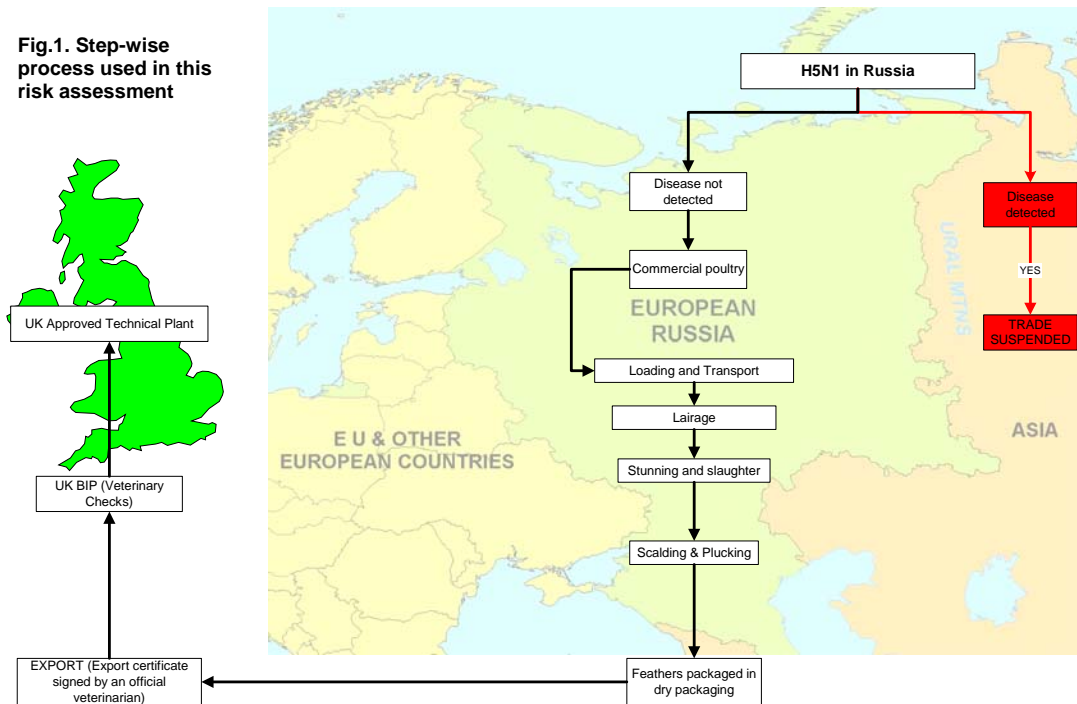
### **3.2 General considerations**

Once the disease is detected, its spread within the country is often controlled by application of various disease control measures. These measures are often applied within the defined affected areas or regions to prevent its spread into unaffected areas or regions.

Fig.1. outlines, very broadly, the step-wise process (release assessment pathway) that was followed in this assessment. It is emphasised that the

individual steps should be viewed as basic indicators of the process. That is, at the regional (or supplier base) level the unit of interest is the commercial poultry operation. The number of birds within a flock and the number of flocks per farm may be variable.

**Fig.1. Step-wise process used in this risk assessment**



For a given consignment of unprocessed feathers, it is considered that the likelihood of contamination would depend on the proportion of supplying farms that are not infected compared to the proportion of farms that are infected with H5N1 virus but remain undetected and the distribution of within-flock prevalence in commercial poultry birds (and/or as a contaminant) supplied from infected farms.

No introduction of HPAI H5N1 or any avian influenza (AI) virus to commercial poultry operations in any country has ever been attributed to imports of unprocessed feathers.

## 4 Risk assessment

### 4.1 Definitions and terminology

For the purpose of the release assessment section (Section 4.3) of this qualitative risk analysis, the following definitions will apply (OIE, 2005b):

Term	Definition
<b>HPAI (HPNAI – highly pathogenic notifiable avian influenza)</b>	<i>“HPNAI viruses have an IVPI in 6-week-old chickens greater than 1.2 or, as an alternative, cause at least 75% mortality in 4-to 8-week-old chickens infected intravenously. H5 and H7 viruses which do not have an IVPI of greater than 1.2 or cause less than 75% mortality in an intravenous lethality test should be sequenced to determine whether multiple basic amino acids are present at the cleavage site of the haemagglutinin molecule (HA0); if the amino acid motif is similar to that observed for other HPNAI isolates, the isolate being tested should be considered as HPNAI” (OIE, 2005b)</i>
<b>Incubation period for HPAI</b>	21 days (OIE, 2005b)
<b>Disease</b>	Refers to the occurrence of clinical disease due to H5N1 infection in any type of birds
<b>Infection</b>	Describes the state in which commercial poultry harbours H5N1 in its gastrointestinal tract or other organs
<b>Contamination</b>	Refers to the presence of H5N1 on the external surface (e.g. feathers) of commercial poultry destined for slaughter

For the purpose of the release assessment section (Section 4.3) of this qualitative risk assessment, the following terminology will apply (OIE, 2004):

Term	Definition
<b>Likelihood</b>	Probability; the state or fact of being likely
<b>Likely</b>	Probable; such as well might happen or be true; to be reasonably expected
<b>High</b>	Extending above the normal or average level
<b>Highly</b>	In a higher degree
<b>Low</b>	Less than average; coming below the normal level
<b>Negligible</b>	Not worth considering; insignificant
<b>Remote</b>	Slight, faint
<b>Would</b>	To express probability; past of Will: expressing a wish, ability, capacity, probability or expectation

### 4.2 Legal trade – import of unprocessed feathers

#### 4.2.1 EU rules – any country

EU rules allow for import of unprocessed feathers from any country that is not subject to restrictions against HPAI (Fig.2). Such consignments must be dry and securely packed in dry-packaging. EU rules require these consignments to be accompanied by a commercial document; subject to veterinary checks at a BIP and go directly to an approved technical or intermediate plant in the importing EU Member State (European Commission, 2002). This means that official authorities should ensure that the destination plant is on the list of approved plants. The transfer of such consignment from a BIP to an approved technical plant does not require veterinary supervision.

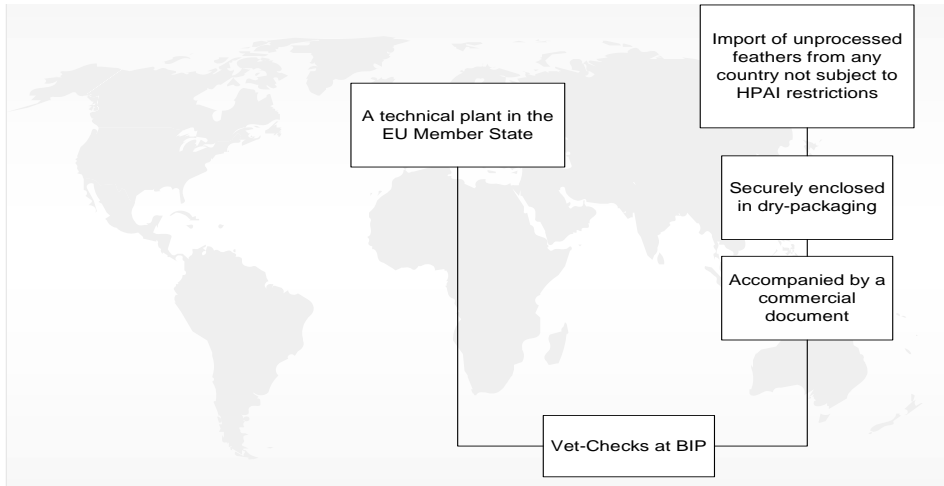


Fig.2. EU rules for import of unprocessed feathers - any country not subject to restrictions

#### 4.2.2 Trade data - Imports of unprocessed feathers into the UK

Our records indicate that no imports of unprocessed feathers to the UK from any country, including Russia, have taken place for more than a year.

#### 4.3 Release assessment

##### 4.3.1 Unprocessed feathers

**Conclusion:** There is a negligible likelihood of introducing H5N1 virus to the UK from western Russia (the part of Russia adjacent to Europe) through legal trade in unprocessed feathers providing the EU rules and procedures outlined concerning the importation of feathers are complied with.

##### **Key facts:**

- a) *Consignments must be accompanied with the official certificate from Russia and subjected to veterinary checks at the Border Inspection Post (BIP);*
- b) *EU rules require unprocessed feathers to be sourced from slaughtered poultry that has been examined and showed no clinical signs of or grounds for suspecting avian influenza;*
- c) *Such feathers must be enclosed in packaging and dry;*
- d) *These consignments are required to go directly to an approved technical plant or intermediate plant in the UK;*
- e) *Approved technical plants in the UK are required to apply appropriate risk-reduction measures to destroy potential pathogens. The plants are also subject to veterinary inspection and supervision.*

#### Supporting evidence

Following the outbreaks of H5N1 in southern Russia, the importation of unprocessed feathers from the whole territory of Russia to the UK and the EU has been suspended from the end of August 2005 (Defra, 2005; European Commission, 2005). This trade was suspended on the basis that there was a possibility that HPAI infection could be active, but undetected, in other parts of Russia.

In the context of the most recent information received from the Russian veterinary authorities, this risk assessment considers the following issues:

#### **4.3.1.1 EU rules – western Russia**

The EU Commission have now adopted a proposal that regionalises western Russia and allows importation of unprocessed feathers from western Russia. The EU rules for western Russia will require official certification of the consignments of unprocessed feathers. This requirement does not apply to any other country that is not under any restrictions for HPAI (Fig.2). This risk-reduction measures reflects the current status of the disease in Russia to take into account that no outbreaks have been reported from western Russia.

EU rules require an official certificate to state that unprocessed feathers from European Russia have been sourced from slaughtered poultry that has been examined and showed no clinical signs of or grounds for suspecting avian influenza. Such feathers must also be enclosed in packaging and dry and presented to a BIP for inspection (see Fig.1).

An EC Food and Veterinary Office mission in March 2004 found that Russia has a system to ensure that export veterinary certification was issued under the control of the competent authority (FVO, 2004).

#### **4.3.1.2 Production of unprocessed feathers – General principles**

We do not currently have specific information on the processes applied in western Russia for poultry loading and transportation; lairage, ante-mortem inspection, slaughter and plucking. This qualitative risk analysis assumes that the sourcing of and processing of poultry in western Russia would be along the following general principles:

#### **4.3.1.2.1 Disease detection - Poultry commercial operations**

Domestic poultry are considered to be aberrant (new) hosts for avian influenza (Suarez, 2000). When introduced, H5N1 virus appears to multiply in the intestinal and respiratory tract and causes systemic infection. In natural infection, it appears that the incubation period for H5N1 in domestic poultry (e.g. poultry, geese, ducks) is very short. Thus, it is likely that infection will result in overt clinical signs within a short period of time.

It is generally considered that HPAI H5N1 virus is lethal to domestic chicken and geese. Although it could be lethal for domestic ducks, concerns have been raised that the virus may be present in apparently healthy domestic ducks without showing clinical signs. Nevertheless, this virus from ducks had the ability to cause clinical disease in chicken (Chen and others, 2004). It should also be noted that the recent experimental research suggested that HPAI H5N1 have the ability to revert to a low pathogenicity for ducks after one passage in ducks but still remain classified as HPNAI since they are still pathogenic for other poultry. such as for domestic chicken (Hulse-Post and others, 2005).

It is considered unlikely that any introduction of HPAI H5N1 into commercial domestic poultry (chicken, geese, ducks) will remain undetected by the Russian authorities. Should such introduction occur, chicken are most likely to develop clinical signs resulting in high mortality. As the outbreaks in southern Russia demonstrated, these events are highly likely to be brought to attention of, and investigated by the authorities.

#### **4.3.1.2.2 Loading and transport of poultry for slaughter**

It is possible but considered unlikely that poultry would be selected for slaughter while incubating the disease. Even so, it is likely that the stress of loading and transportation may cause clinical disease to develop. However, there would be then insufficient time for incubation and spread within the poultry consignment selected for slaughter (Defra, 2004).

Poultry are usually transported to a slaughterplant and prepared for slaughter within a relatively short period of time. This usually takes less than 12 hours in total after loading on the farm. Nevertheless, there is no data in the available literature to indicate the prevalence of H5N1 virus in the faeces of poultry presented for slaughter or possible contamination of feathers during transport and lairage.

#### **4.3.1.2.3 Lairage**

Poultry for slaughter are usually kept in a holding area for a very short period of time to avoid loss of carcass yield. As mentioned in section 4.4.1.2.2 above, it is considered unlikely that a high proportion of poultry will be incubating disease without a proportion of them showing clinical signs.

It is likely that any increase in numbers of moribund poultry, poultry dead on arrival would be brought to the attention of the authorities.

#### **4.3.1.2.4 Stunning, killing and bleeding**

It is considered unlikely that these processes will result in cross-contamination of slaughtered poultry with H5N1 virus. It is also a fundamental property of the viruses that they require living host cells in order to replicate. Thus, the number of viable H5N1 virus particles, if present, can only be expected to decrease.

#### **4.3.1.2.5 Plucking**

It is generally considered that feathers itself do not contain the virus, but could be externally contaminated by faeces, which is the most likely source of the virus if poultry is infected. Plucking is the most likely step where contamination of feathers will occur, if the virus is present.

We are currently uncertain what type of plucking may be used in western Russia. In general, there are two types of plucking: 'dry' and 'wet'. 'Dry' plucking means that feathers are hand-plucked and will be dry. In this case, any potential for cross-contamination would depend on how clean the poultry were before slaughter. Generally, it could be considered that potential for cross-contamination would be less than if mechanical plucking was used.

Mechanical ('wet') plucking may follow scalding. Scalding is the process where 'turbulent hot water' (usually at 52<sup>o</sup>C or 58-60<sup>o</sup>C) is used to relax follicles to release feathers (Barker and others, 2000). Scalding is a rapid heat process, therefore the time-temperature combination would not be sufficient to destroy the virus.

Thus, if infected poultry are slaughtered, this procedure would result in a increased quantity of feathers being cross-contaminated. Nevertheless, the dilution factor will play a role in reducing the number of the virus particles that may be present on contaminated feathers. Although plucking can also contribute to an even higher quantity of feathers being cross-contaminated, it is likely that such process will further contribute to a reduction in the number of virus particles on contaminated feathers. In addition, the feathers would be wet which would require some other processes to dry them before packing. There is an uncertainty whether such drying would further reduce any viral load, if present.

### **4.3.1.3 Importing unprocessed feathers to the UK**

#### **4.3.1.3.1 Border Inspection Post**

EU rules require that each consignment of unprocessed feathers must be subjected to veterinary checks at the Border Inspection Post (BIP) in the UK

and sent directly to an approved technical or intermediate plant but not under official control (European Commission, 2002).

#### **4.3.1.4 Approved technical & Intermediate plants in the UK**

Technical and intermediate plants must be individually approved under EU rules (European Commission, 2002). In Great Britain, the approval is granted by the State Veterinary Service. There are currently some 55 such plants in the UK central database, but it does not record which of them process feathers. Nevertheless, the State Veterinary Service has advised that there are currently eight technical plants in Great Britain approved to process feathers. None of these plants source unprocessed feathers from abroad.

If unprocessed feathers are used for other purposes (e.g. clothing, insulation, bedding etc), it is up to the local veterinary office to assess that the treatments taking place at the technical plant are adequate to ensure that pathogens, potentially associated with such consignments, are destroyed. Treatment with steam current is one of the processes that could be approved for this purpose.

FAO consider that steam treatment at 70<sup>0</sup>C is sufficient to inactivate pathogens, including the HPAI virus in poultry manure or poultry litter (FAO, 2005).

EU rules classify feathers from poultry which showed no clinical signs of disease as category 3 material. However, due to the ban on processed animal protein in feedstuffs it is illegal to feed livestock, including poultry, on feathermeal. Even if the ban on processed animal protein was lifted and they were used for animal feed, they would have to be rendered, which is considered sufficient to destroy pathogens of concern (European Commission, 2002), including H5N1 virus.

## **4.4 CONCLUSION**

Trade in unprocessed feathers of domestic poultry between Russia and the UK is subject to EU rules which require official certification. The likelihood of introducing H5N1 virus to the UK from western Russia (the part of Russia adjacent to Europe) through legal trade is considered negligible. This estimate is no greater than the likelihood of the introduction of disease from importing unprocessed feathers from any Third country that is not subject to HPAI or ND restrictions and from which official certification is not required under EU rules.

The current estimate should be viewed in the context of reported evidence of absence of H5N1 outbreaks in western Russia and the assumption that Russian authorities have reliable certification system for unprocessed feathers. This estimate is also supported by practical experience so far that no H5N1 outbreaks in birds (domestic or wild) have been attributed to imports of unprocessed feathers.

An outbreak of H5N1 in any trading country is of concern to the UK and the EU. Russia reports that the outbreaks of H5N1 have been confined to non-commercial village poultry, in six regions in southern Russia (the Asian part of Russia). These outbreaks have been subjected to eradication and no further outbreaks have been reported since mid-August 2005. There has been only one report of an H5N1 outbreak in a commercial poultry operation in southern Russia and this has been effectively eradicated.

According to the Russian veterinary authorities, there are no reports of disease outbreaks in commercial poultry operations outside the affected regions in southern Russia. That is, no outbreaks have been detected in western Russia. Nevertheless, IAHD will continue to monitor developments and will provide an update on the situation if required.

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