

Avian Influenza Outbreaks

in the USA

(12/2014 – 5/2015)

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Agenda

- **The present situation**
- **Data sources**
- **Wild bird flyways and the spatial distribution of the outbreaks**
- **Phases of the outbreaks: a time-spatial analysis**
- **Affected number of birds by poultry species**
- **Vaccination or not?**
- **Summary: Possible economic impacts**

1.

The present situation

History of AI outbreaks in North America

Year	Region	Virus type
1983/84	Pennsylvania	H5N2
2002	Virginia	H7N2
2004	British Columbia	H7N3
2012	Jalisco, Mexico	H7N3
2014/15	California, Minnesota, Wisconsin, Dakotas Iowa, Nebraska	H5N8, H5N2

The recent AI outbreaks are the most severe epizootic disease event in North America with over 40.7 mill. affected birds until May 21st.

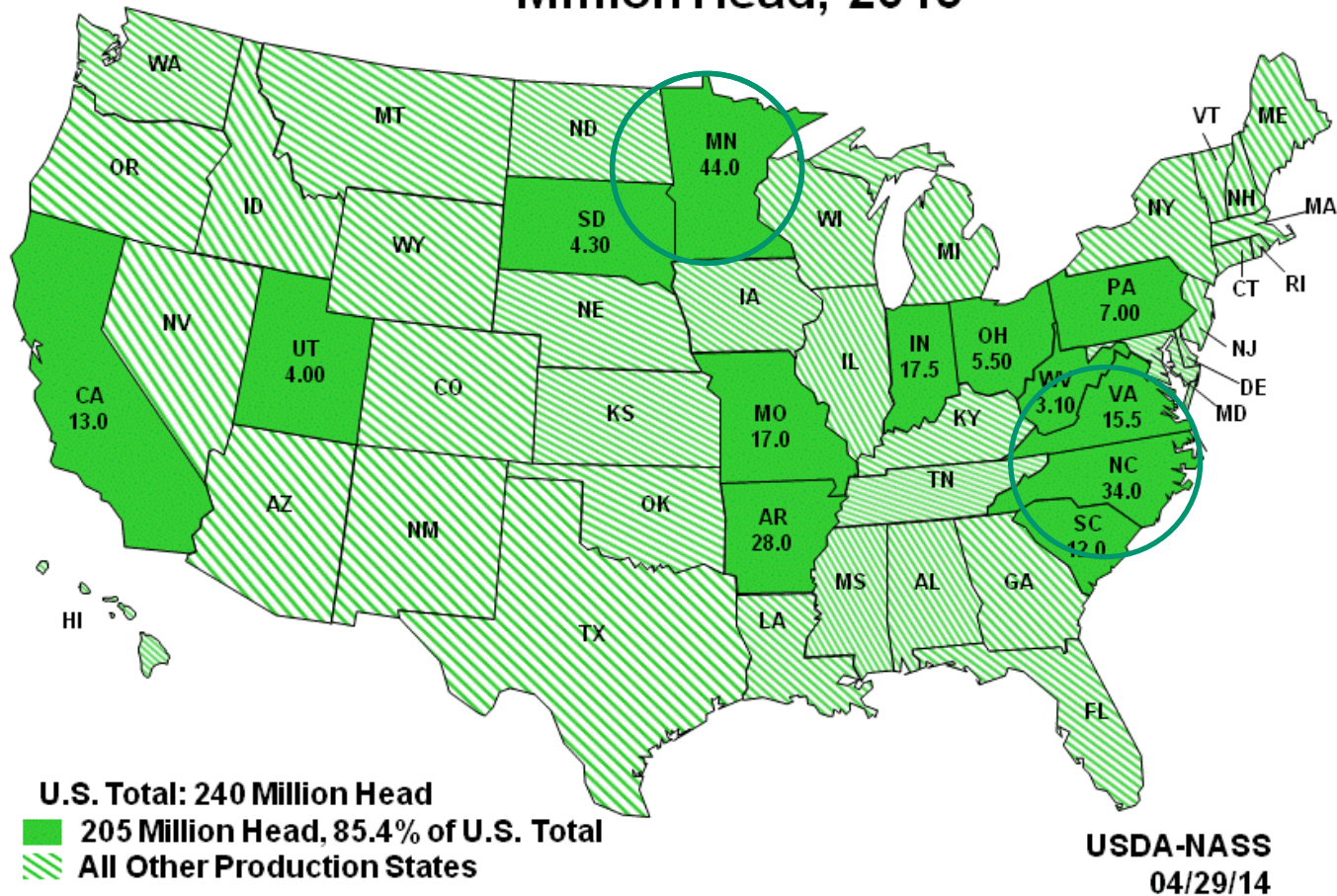
2.

Data sources

The analysis is based on the following sources:

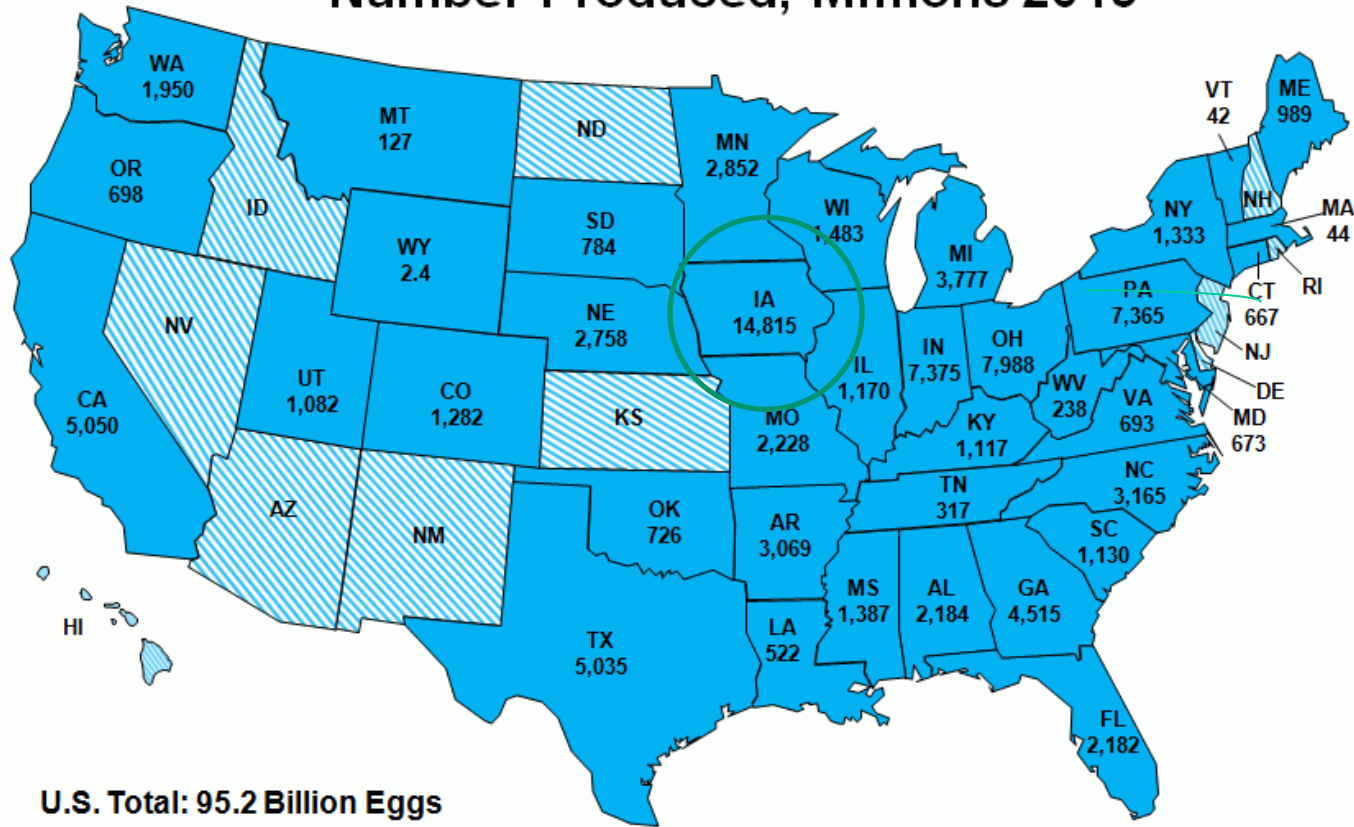
- **USDA: Animal and Plant Health Inspection Service (APHIS)**
- **Reports of the State Veterinarians of Iowa, Minnesota, Wisconsin, North and South Dakota**
- **Personal information from Prof. Dr. Hongwei Xin (Egg Industry Center, Iowa State University)**
- **WATTAgNet.com**

Turkeys: Number Raised by State Million Head, 2013



Note: In 2013, Minnesota produced 18 % of US turkeys

Annual Egg Production by States Number Produced, Millions 2013



U.S. Total: 95.2 Billion Eggs
 ■ 92.8 Billion Eggs, 98% of U.S. Total
 ▨ All Other Production States

USDA-NASS
04/29/14

Note: In 2013, Iowa produced 16 % of US eggs

3.

**Wild bird flyways and spatial distribution
of the outbreaks**

Wild Bird Flyways North America

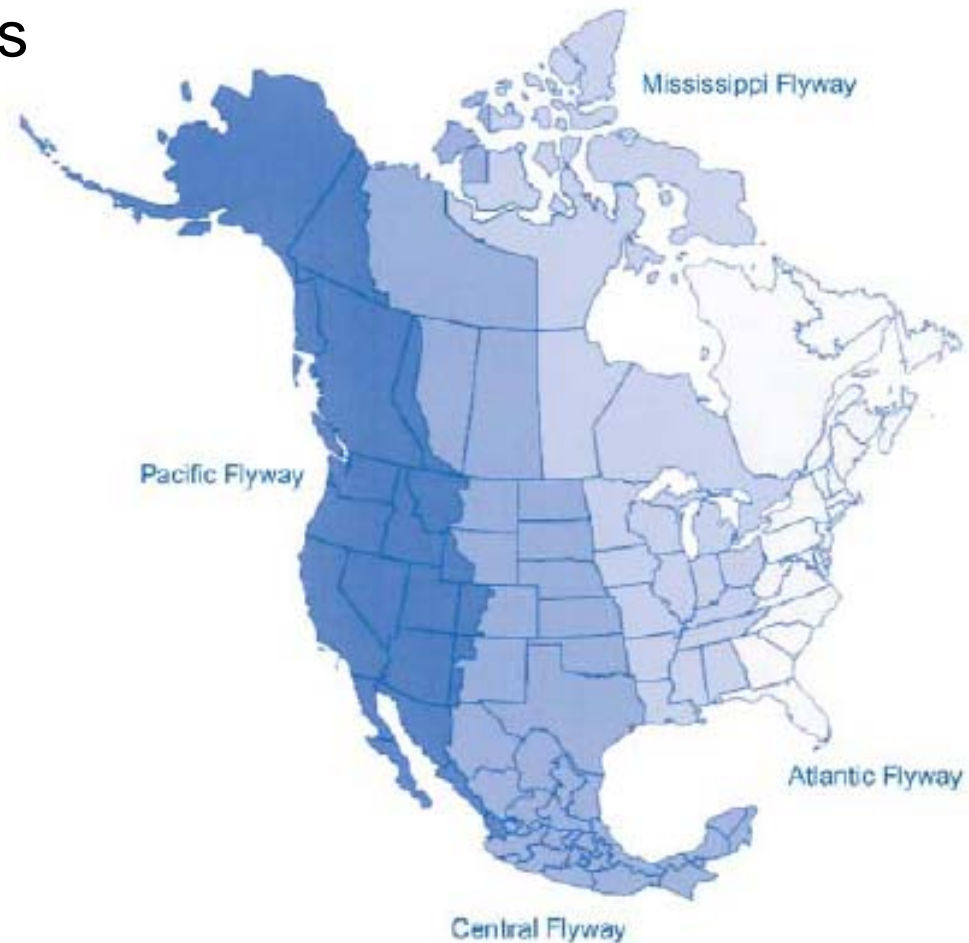
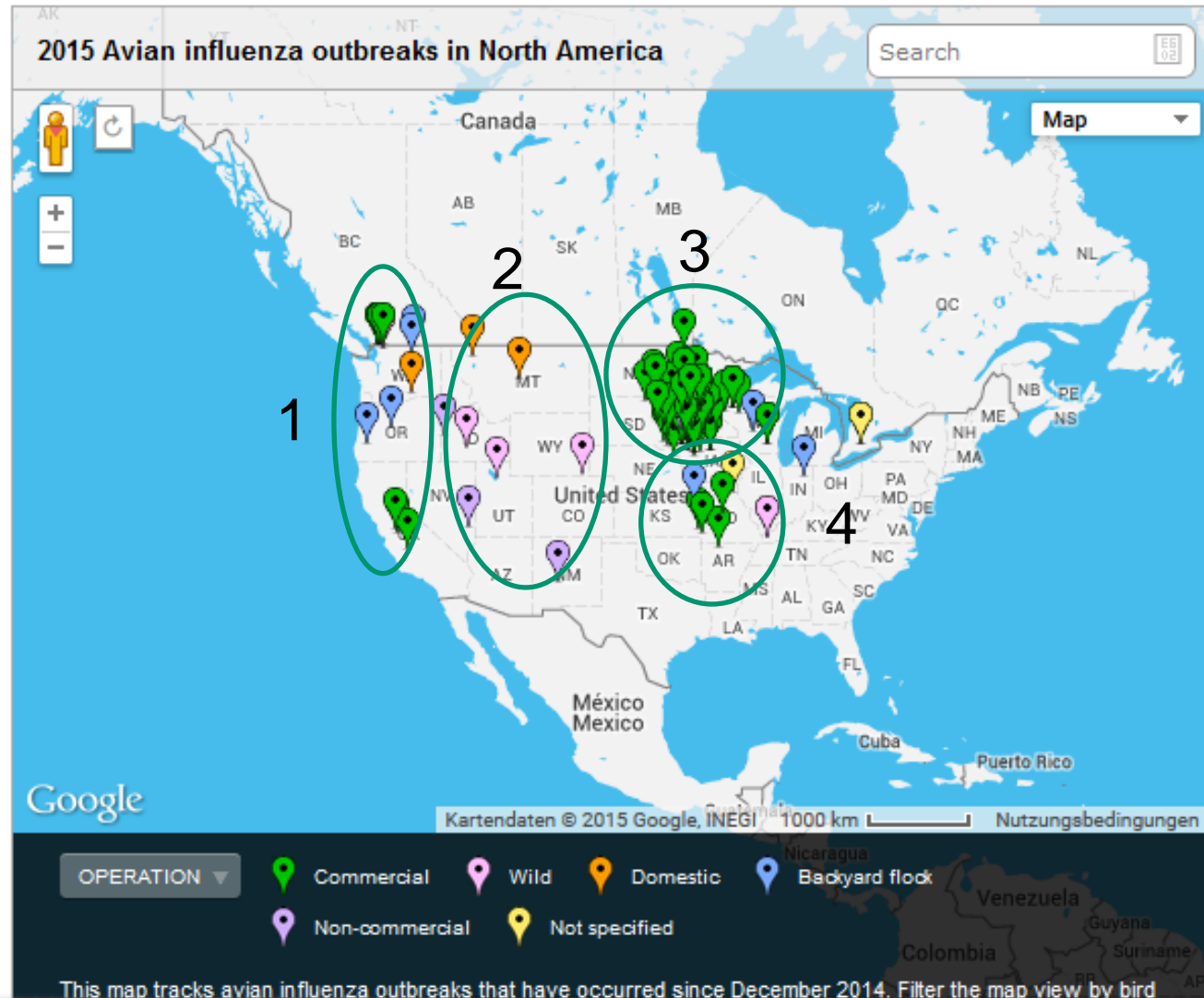


Fig. 6. North American flyways used for the management of migratory waterbirds – especially as related to the regulation of hunting.

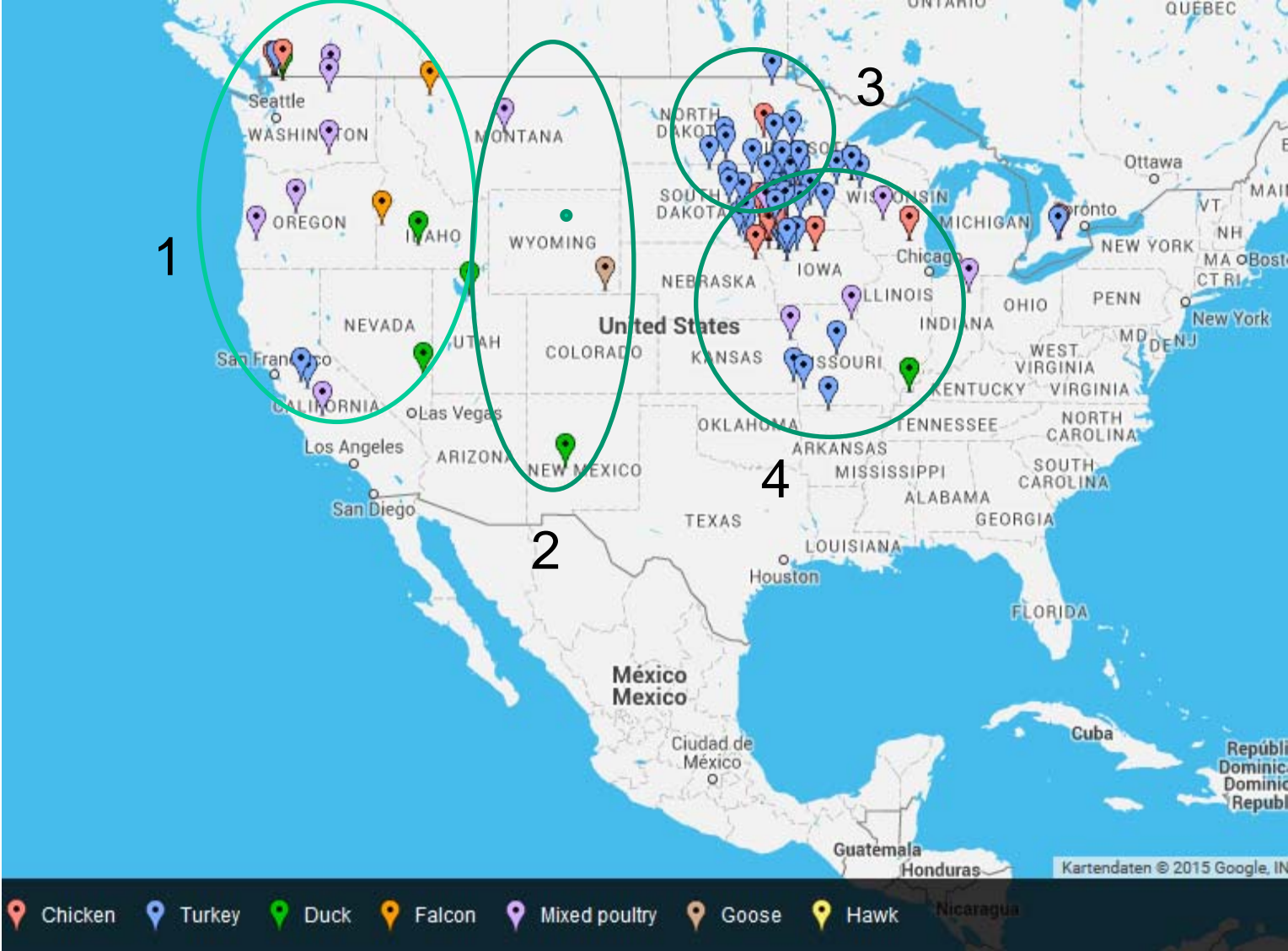
Track 2015 avian influenza outbreaks in North America

An interactive map tracking bird flu cases in North America to help poultry growers, producers and farmers monitor breaking US avian influenza outbreaks

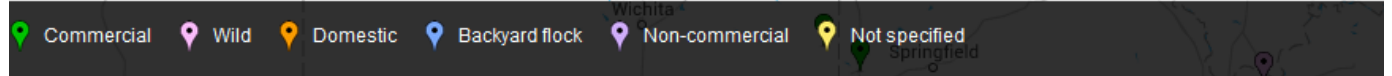
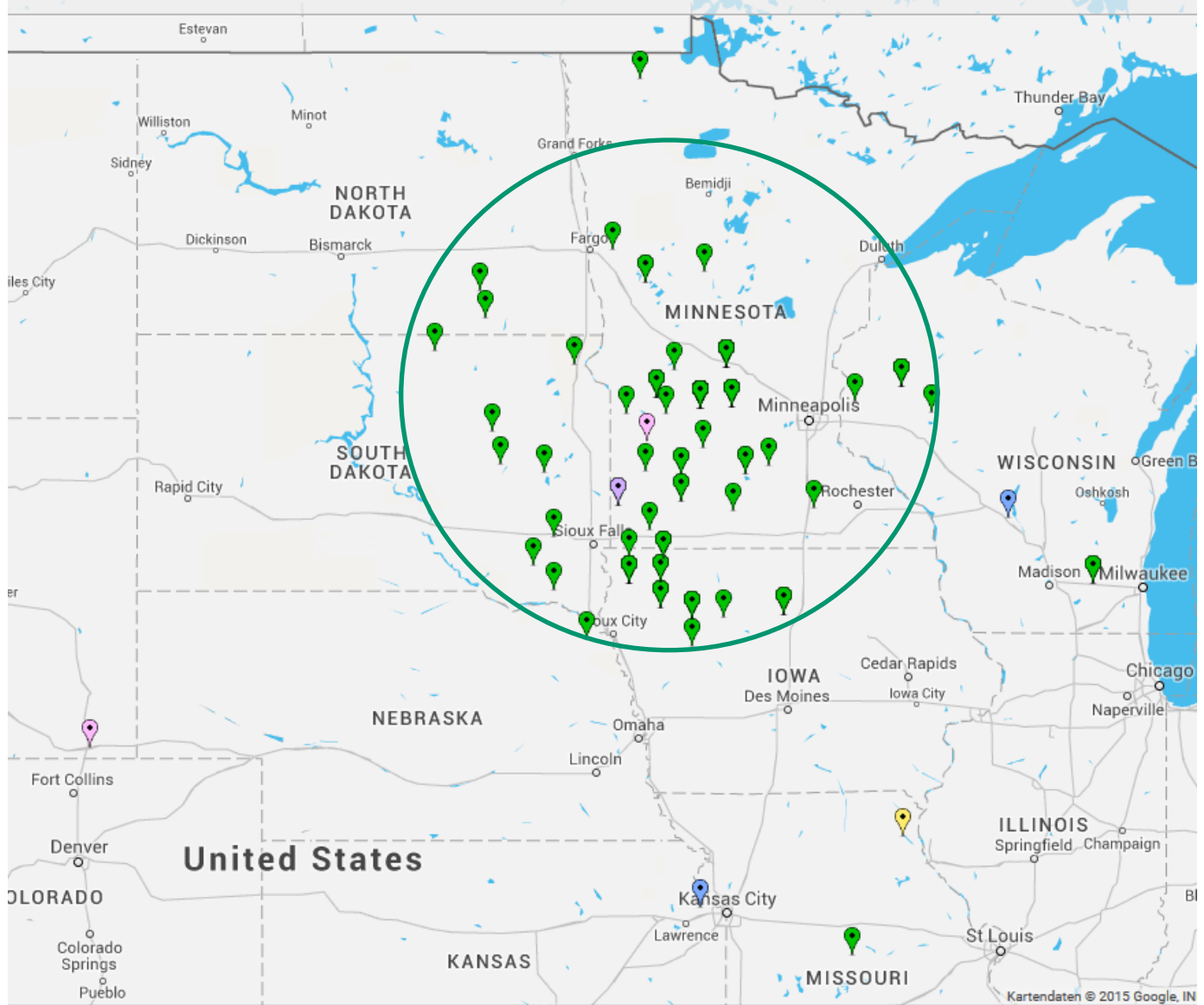
Status:
May 20th
2015



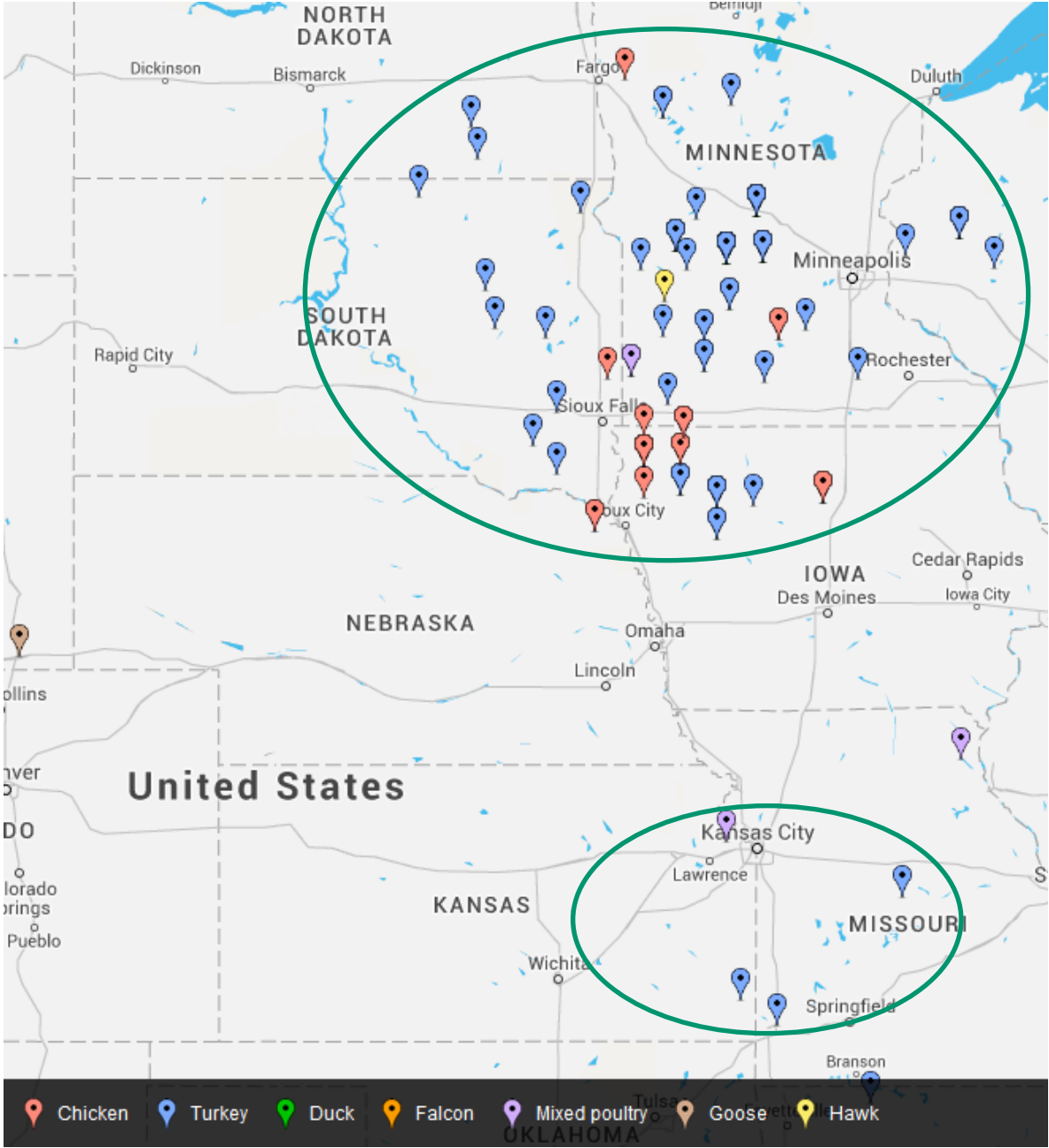
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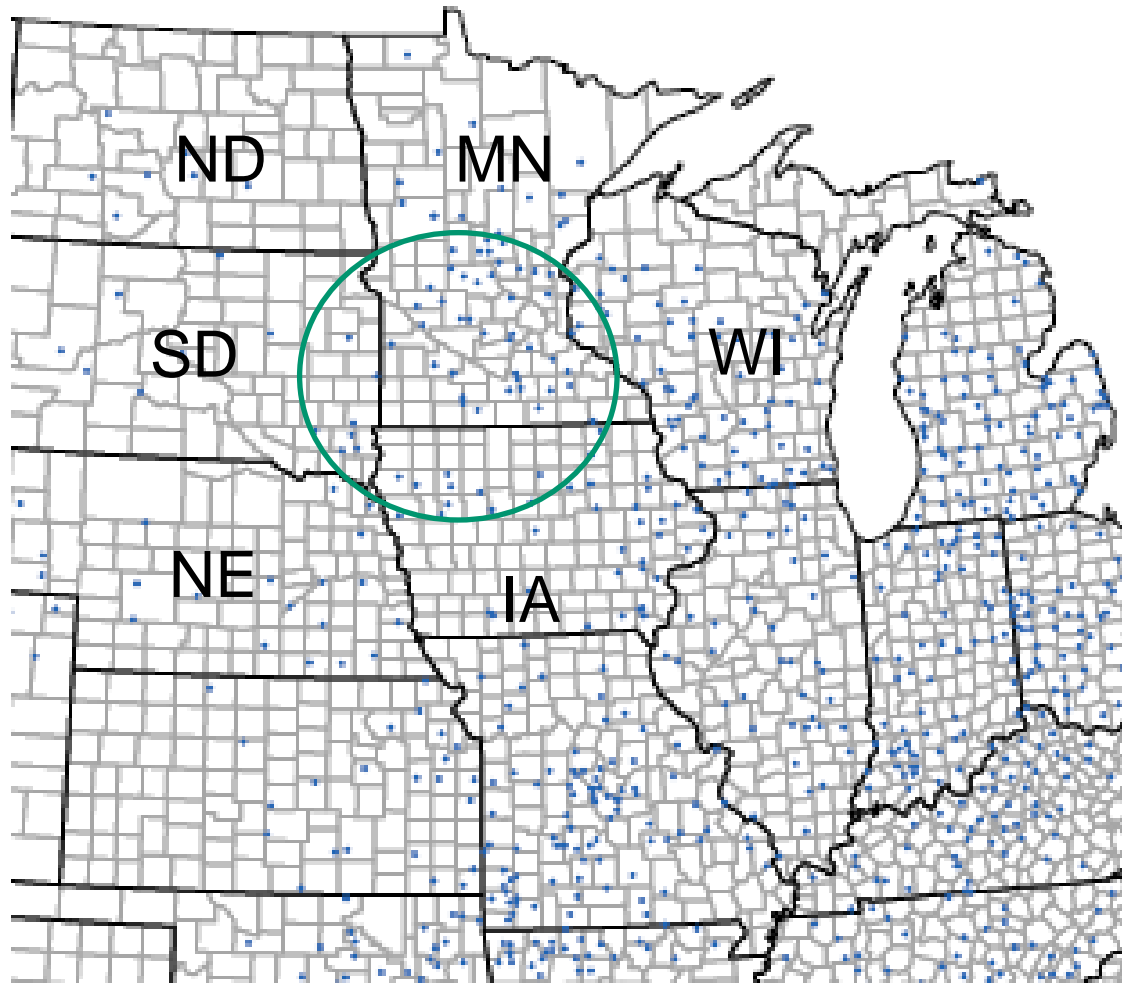
outbreaks in North America



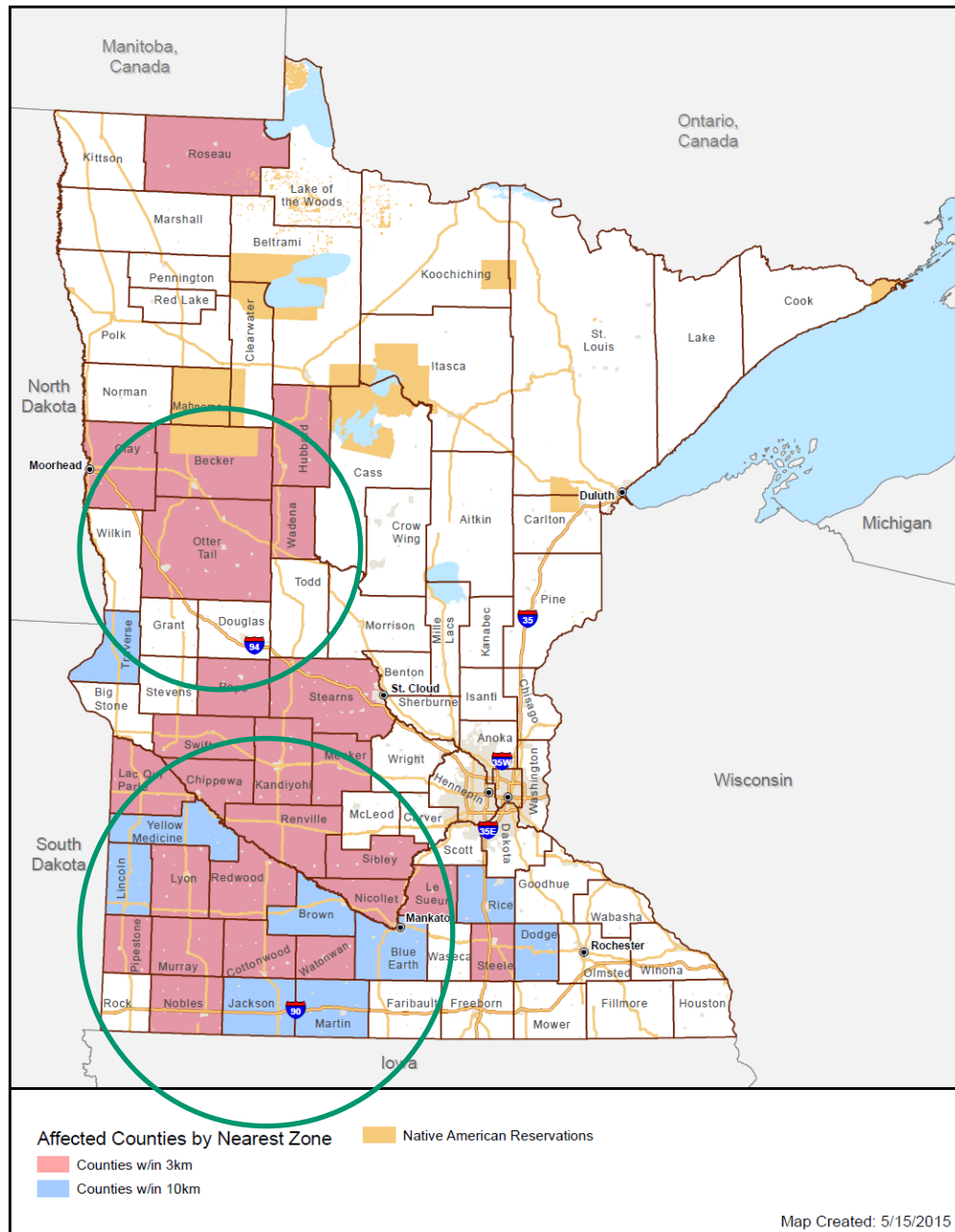
The core area of the outbreaks



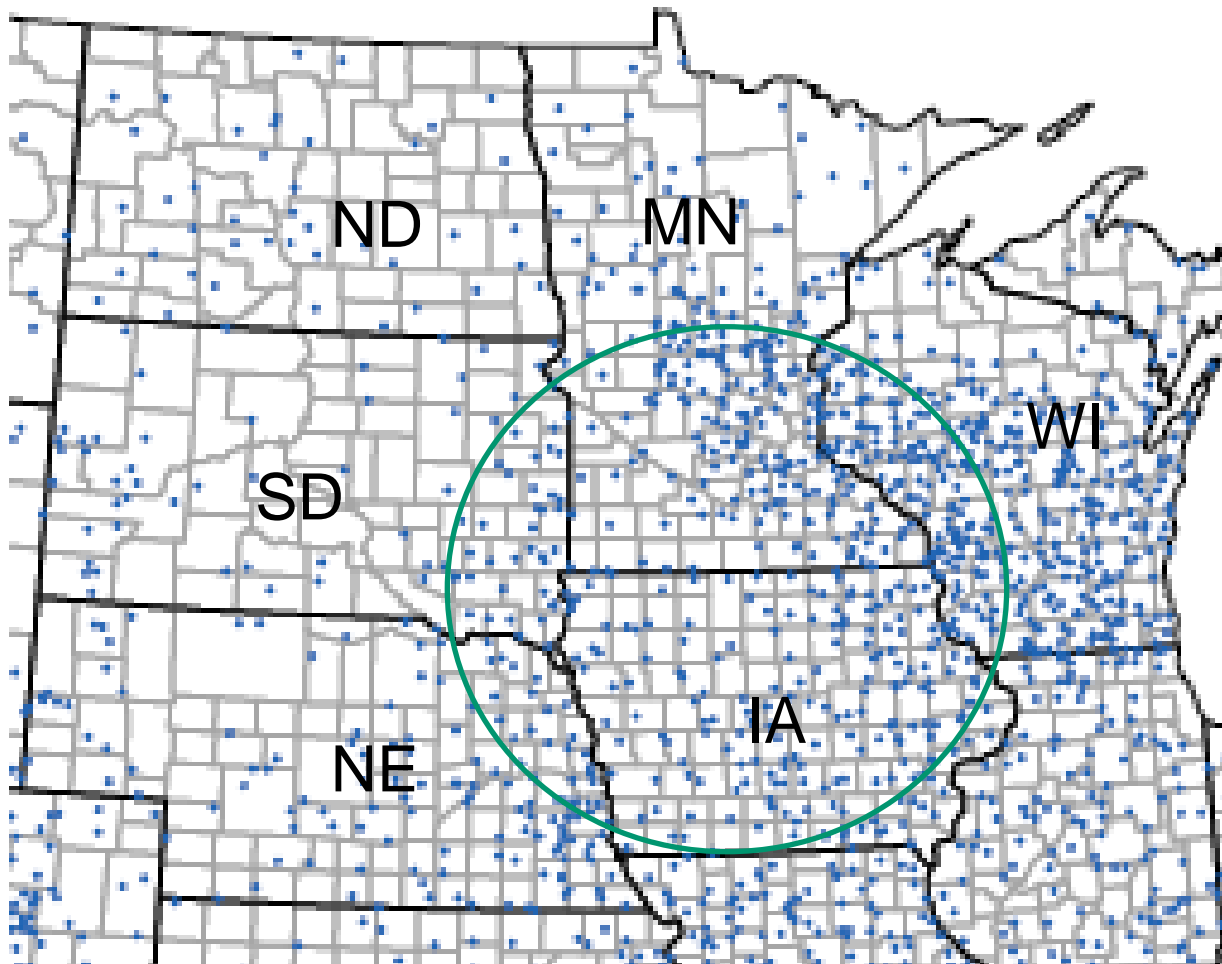
Turkey farms in the upper Midwest



AI outbreak affected counties in Minnesota



Laying hen farms in the upper Midwest



Phases of the introduction and dissemination of the AI virus types

- 1. Wild birds, backyard flocks and commercial flocks in BC, WA, OR and CA (H5N8/H5N2)**
- 2. Wild birds and non-commercial flocks in the Western Great Planes and Eastern Rocky Mountain states (H5N8/H5N2)**
- 3. Turkey flocks in Minnesota, Dakotas**
- 4. Turkey and layer flocks in Iowa, Minnesota and the Dakotas; southward movement**
- 5. Layer farms in Nebraska, westward movement**

4.

Phases of the outbreaks:

A time-spatial analysis

Date of first outbreaks

State	Outbreak	Poultry species	Number of birds
California	23. 1. 2015	Turkeys	134,400
California	12. 2. 2015	Chickens	112,900

State	Outbreak	Poultry species	Number of birds
Minnesota	4. 3. 2015	Turkeys	26,310
Minnesota	23. 4. 2015	Chickens	175,000

State	Outbreak	Poultry species	Number of birds
Iowa	24. 4. 2015	Turkeys	33,900
Iowa	20. 4. 2015	Chickens	3,800,000

State	Outbreak	Poultry species	Number of birds
Nebraska	11. 5. 2015	Chickens	1,700,000
Nebraska	15. 5. 2015	Chickens	1,600,000

The time-spatial pattern of the AI outbreaks (1)

Time period	States	Poultry species	Affected farms	Virus type
19. 12. 14 – 16. 1. 2015	WA, OR, ID	Backyard flocks	5	H5N8 H5N2
23. 1. – 17. 2. 2015	ID, CA	Backyard flocks, turkeys	5	H5N8 H5N2
4. 3. – 28. 3. 2015	AR, KS,MO, MN	Turkeys , backyard flocks	7	H5N2

Until February: only Pacific flyway

Beginning in March: outbreaks focus on Mississippi flyway

USDA, APHIS

The time-spatial pattern of the AI outbreaks (2)

Time period	States	Poultry species	Affected farms	Virus type
1. 4. – 10. 4. 2015	MN, ND, SD	Turkeys , backyard flocks	16	H5N2
11. 4. – 20. 4. 2015	MN , WI, SD, IA	Turkeys, Layers , backyard flocks	25	H5N2

Beginning in April: Outbreaks focus on Mississippi flyway, but also cases in the Central flyway

USDA, APHIS



The time-spatial pattern of the AI outbreaks (3)

Time period	States	Poultry species	Affected farms	Virus type
21. 4. – 28. 4. 2015	MN, IA , ND, WI	Turkeys , Layers	43	H5N2
29. 4. – 7. 5. 2015	IA, MN , WI, MO	Turkeys, Layers , ducks	44	H5N2
8. 5. – 15. 5. 2015	IA, MN , SD, NE	Layers, Turkeys, Mixed poultry	26	H5N2 H5N8
16. 5. – 21. 5. 2015	IA, MN , SD	Layers, Turkeys	11	H5N2

Beginning in April: Outbreaks focus o Mississippi flyway, but also more cases in the Central flyway, southward dissemination

AI outbreaks between 12/2014 and 5/2015 (as of May 21st)

State	Outbreaks
Minnesota	83
Iowa	57
Wisconsin	10
South Dakota	9
Washington	5
California, Missouri, North Dakota, Oregon, Nebraska (2 each)	10
Arkansas, Idaho, Indiana, Kansas, Montana (1 each)	5
Total	179

The time spatial analysis shows:

1. In the initial phase, only backyard flocks and three commercial farms in California were affected (wild birds caused the outbreaks)
2. In March, first turkey farms in Minnesota were affected (wild birds caused the outbreaks)
3. From April on, infection of large layer flocks in confined laying hen farms began in Iowa (wild birds and infections caused by persons),
rapid increase of new outbreaks and affected birds

5.

**Affected number of birds
by poultry species**

Affected number of birds by the AI outbreaks (as of May 21st, 2015)

Poultry species	Affected birds*
Laying hens	34,318,100
Turkeys	6,401,600
Mixed poultry	1,373
Total	40,721,073

* The number of affected birds will increase considerably, because there are no data on the flock sizes of 10 affected farms.

USDA, APHIS

Number of turkey farms affected by the AI outbreaks (as of May 21st, 2015)

Size class (in 1,000 birds)	Affected farms
0 - 5	1
5 - 10	3
10 - 25	20
25 – 50	39
50 – 100	35
> 100	12
Total	110
Average flock size	78,790

Number of layer farms affected by the AI outbreaks (as of May 21st, 2015)

Size class (in 1,000 birds)	Affected farms
0 – 50	5
50 – 100	5
100 – 250	7
250 – 500	4
500 – 1,000	5
1,000 – 2,500	7
2,500 – 5,000	2
> 5,000	1
Total	36
Average flock size	953,280

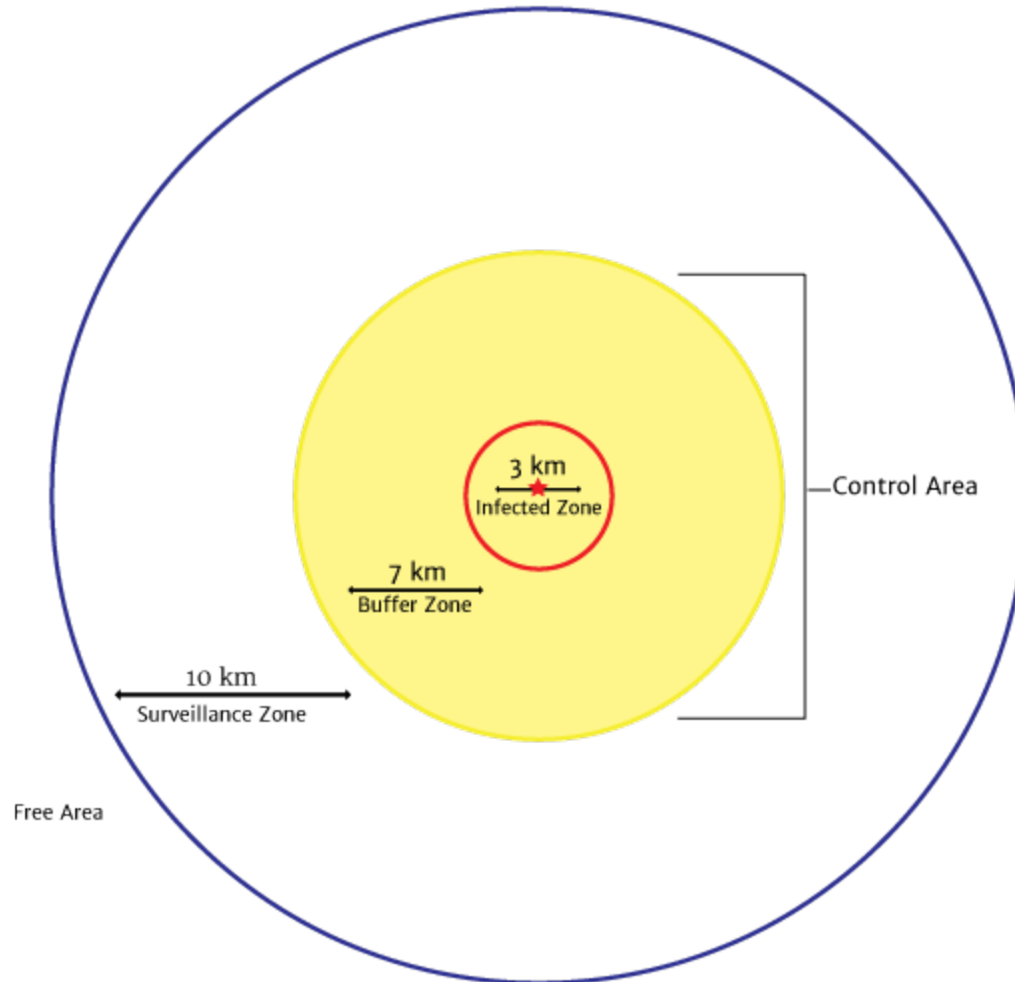
The AI outbreaks affected:

- 45 – 50 % of the laying hen population of Iowa
- about 10 % of the layer flocks of the USA
- about 40 % of the turkey flocks of Minnesota

Note:

- 85 %** of the affected layer flocks were producing eggs **for further processing**

Minnesota Highly Pathogenic Avian Influenza Response Zone



What happens with the eradicated birds?

- **Turkeys: composted in the barns**
- **Layers: Composted outside the barns, **landfills (!)**, burnt (only small flocks)**

6.

Vaccination or not?

Main arguments in favour of vaccination:

- **Stamping out not adequate** to control AI
- **Already wide spread**
- **High risk of further dissemination**
- **To protect valuable flocks, i. e. breeder herds**

Main arguments against vaccination:

- Stamping out is possible and sufficient
- Vaccination does not prevent infection and creates clinically **silent virus shedders**
- Difficult to differentiate between infected and non infected birds in vaccinated herds
- High costs**
- Trade restrictions**

Concerns of the US broiler industry regarding vaccination:

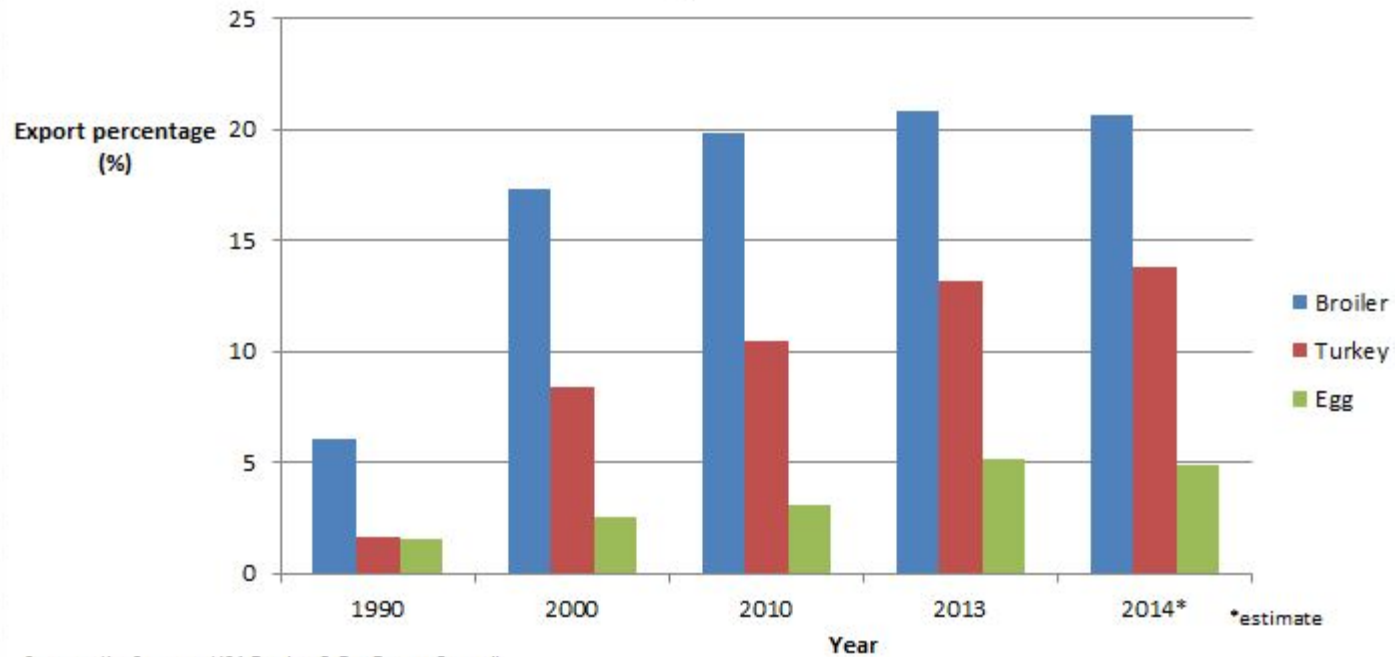
- **Federal authority should be maintained.**
- **Trade ramifications** need to be fully understood before starting a vaccination programmes.
- Strategy to **start biosecurity programmes** as a consequence of the 2014/2015 outbreaks.
- **Effectiveness of available vaccines in turkeys** has to be analysed; strategic plan necessary how to end vaccination.
- **Consequences, if any, on the processing of vaccinated birds for meat production** needs to be determined.

Dr. Ashley Peterson; National Chicken Council)

7.

Economic impacts

Figure 2: Percentage of US poultry and egg production exports

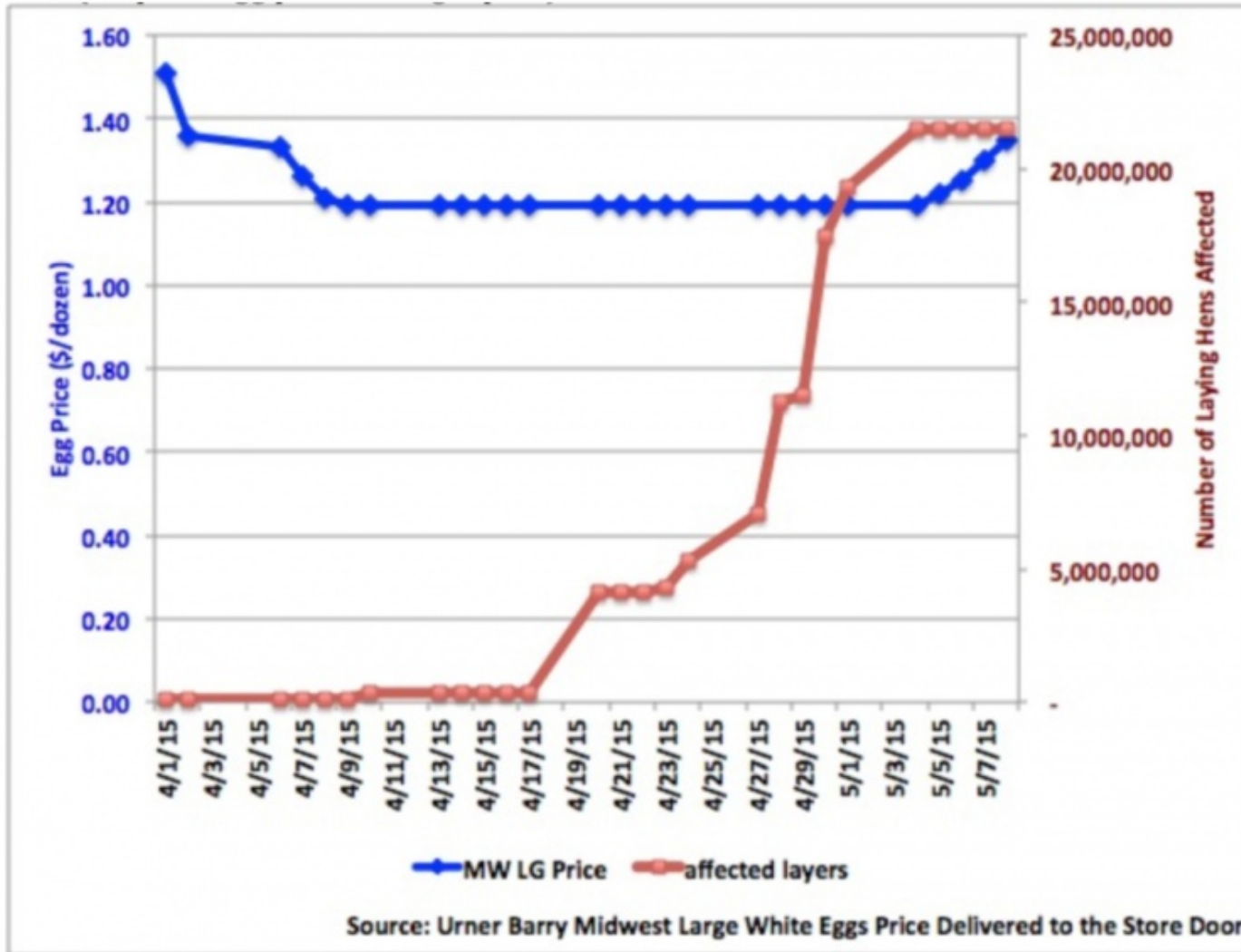


Export restrictions:

- **Ban on all US poultry products:** China, South Korea, South Africa, Thailand
- **Limited restrictions on products from individual states:** Japan, Mexico, Taiwan
- **Limited restriction to countries from individual states:** Canada, Singapore, Hong Kong, EU

About **40 countries** in total have placed restrictions according to the USA Poultry and Egg Export Council

Impacts of the AI outbreaks on the shell egg price

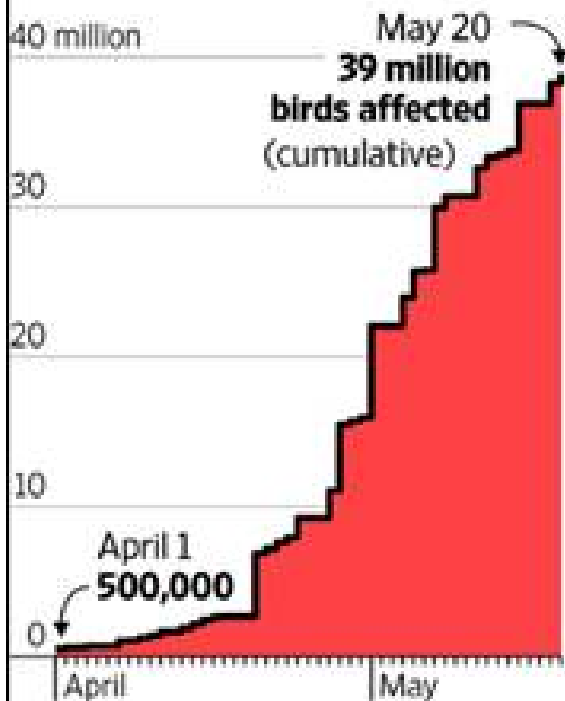


Impacts of the AI outbreaks on the shell egg price

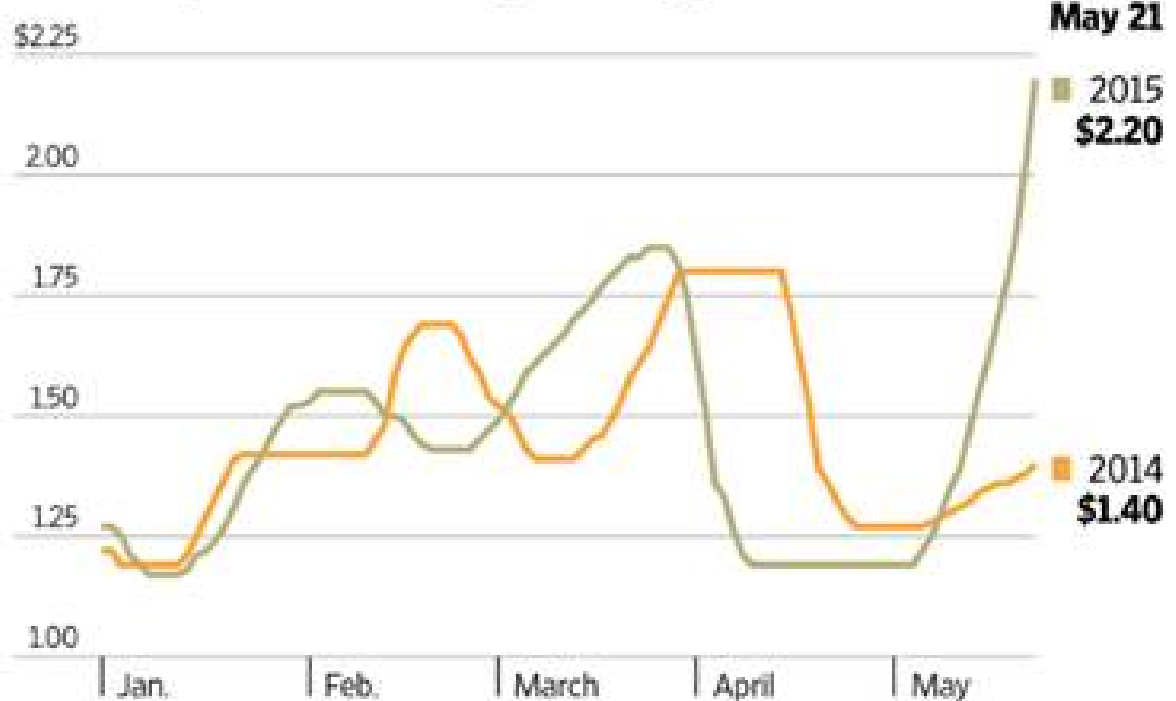
Fast-Spreading Virus

The highly infectious H5N2 strain of avian influenza has forced turkey and egg farmers to cull millions of birds. Egg prices are rising sharply.

U.S. avian flu outbreak this year



Wholesale price for a dozen large white eggs*



*Midwest price Sources: U.S. Department of Agriculture (birds); Urner Barry (eggs)

THE WALL STREET JOURNAL.

Other observed economic impacts:

- **Price increase for eggs, egg products and turkey meat**
- **Lower feed prices because of a decreasing demand for corn (675,000 t) and soybeans (700,000 t)**
- **Futures on the Chicago stock exchange already decreased (corn: - 8.8 %; soybeans: - 7.1 %; soybean meal: - 15.9 %)**
- **Companies start to sell stored feed because of reduced demand and to compensate financial losses**

8.

Summary and perspectives

- The recent AI outbreaks in the upper Midwest are the most severe epizootic event in the US poultry industry
- Until May 21st, over **40.7 mill. birds in 15** states were affected
- About **45 % of the layer flocks in Iowa and about 40 % of the turkey flocks of Minnesota** were affected
- The outbreaks will have far reaching impacts on the future of the egg and turkey industries in these states
- The outbreaks will also have considerable impacts on the US poultry products exports

Thank you for your attention!