# Estimating the level of disease risk and biosecurity on commercial poultry farms in New Zealand

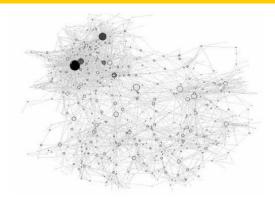
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Supplementary Information 1. Questionnaire used in a survey of poultry producers regarding farm disease risk contacts and biosecurity practices.

The content of this supplementary information has not been edited. All risk and liability rest with the authors.

# CONTACT STRUCTURES IN THE NEW ZEALAND COMMERCIAL POULTRY INDUSTRY



#### Dear Producer,

We are conducting a survey to describe the extent and nature of contacts between commercial farms in the New Zealand poultry industry. Specifically, we are interested in contacts made through the sale of feed, transportation of live poultry and poultry products, regular visits made by industry personnel, and the movement of waste products such as manure, litter and dead birds.

#### Why are we conducting this survey?

Contacts are an important means by which diseases can spread from farm to farm. There have been many changes in the poultry industry since the last contact survey was conducted in 2006. We want to know how these changes have impacted your risk of getting disease from other farms and how we can better help to protect your livelihoods.

#### How will we use the survey information?

We will use this data to reconstruct the industry contact network and develop simulation models to predict how diseases like Avian Influenza and Campylobacter may spread.

#### Confidentiality

All information will be treated as strictly confidential and no information will be used in any way that could reasonably be expected to identify individual persons, practices or organisations.

The study results will only be useful if **all** producers take part. We greatly appreciate your valuable time in completing the survey questions. Sincerely,

Dr. Carolyn Gates Massey University

Then (Dates

## Thank You!











This research study is being conducted by the EpiCentre at Massey University and is fully endorsed by the Poultry Industry Association of New Zealand (PIANZ) and the Egg Producers Federation of New Zealand (EPF) with support from the Ministry for Primary Industries.

#### **INSTRUCTIONS**

#### Please read carefully before beginning the survey

In this questionnaire, we would like you to think about individuals and companies that have visited your farm (e.g. to supply or remove birds, goods or products) throughout the past year. We use the term **farm** to refer to facilities where birds or eggs are kept under a common system of management. In most situations, a farm will be a single physical location. Sometimes a farm may be made up of several distinct physical locations in close proximity, which we call **sites** (see Section 1.3).

For each **farm**, you will be asked to fill out information on:

#### **Farm Demographics**

- 1. Enterprise and farm details
- 2. Farm capacity and management

#### **Routine Contacts**

- 3. Transport companies
- 4. Feed companies
- 5. Live birds and hatching eggs
- 6. Table eggs and poultry products
- 7. Regular movements of personnel
- 8. Manure, litter, and dead birds

#### **Other Information**

- 9. Biosecurity risks
- 10. Additional feedback

#### How many farms are you in contact with? Hatchery A Farm J 15,000 birds **Processing** Feed Company B Facility C Milled feed **Broilers YOUR** 2 tonnes **FARM** Every 7 days Every 42 days Farm E Farm H Farm D Farm G

We will need to link data from all survey respondents to create the final industry contact network so it is important that you provide us with as much accurate detail as possible about the identity of individuals and companies that have visited your farm. Once the study has been completed, you will be provided with a risk map similar to the figure above showing the number of direct (yellow) and indirect (blue) connections to your farm. The identity of the indirect connections will be hidden in the figure to preserve confidentiality.

#### Returning the questionnaire

Please return the questionnaire using the prepaid addressed envelope provided.

#### Questions

If you have any questions or concerns about completing the questionnaire or participating in the study, please contact:

#### **Carolyn Gates**

Massey University Institute of Veterinary, Animal and Biomedical Science (IVABS) Private Bag 11-222 Palmerston North 4442

Tel: (06) 951 8140

Email: c.gates@massey.ac.nz

#### 1. ENTERPRISE AND FARM DETAILS

1.1. Details of the person filling in this questionnaire						
Name						
Position						

1.2. Farm contact details	
Name	
Street or PO Box number	
Town	
Phone (business)	
Phone (home)	
Phone (mobile)	
Facsimile	
Email	
Parent company (if applicable) <sup>a</sup>	

<sup>&</sup>lt;sup>a</sup> A parent company refers to the organisation that owns birds that are raised on one or more farms. Tegel Foods Limited, for example, would be referred to as a parent company.

1.3. Farm location details	Address (town or city only)	Agribase <sup>b</sup> (if present)	Farms Online ID <sup>c</sup> (if present)
Main site (1)			
Other site (2)			
Other site (3)			
Other site (4)			
Other site (5)			

b,c We will only use this information to determine the spatial location of your farm so that we can report how many other commercial farms are in close proximity.

### 1.4. What type(s) of commercial poultry operation do you run on the farm?

If more than one type of commercial poultry operation is present, please indicate approximately what % each contributes to your total farm production.

	Present? (check all that apply)	% of total farm production
Commercial - Breeder		
Commercial - Layer hens		
Commercial - Pullets		
Commercial - Broilers		
Commercial - Turkeys		
Commercial - Hatchery		
Commercial - Ducks		
	Total	100%
Other (e.g. emu, ostrich, aviary birds) – please specify types and numbers of such birds.		

#### 2. FARM CAPACITY AND MANAGEMENT

# 2.1. Over the past year, on average, how many live birds (or fertile eggs for hatcheries) were typically housed on the farm at any given time?

Please also indicate (a) the total number of sheds in which these birds were housed, (b) the average number of birds per shed, and (c) the total combined housing capacity of all sheds present on the farm.

Species	Approximate number of live birds (or fertile eggs)	(a) Total number of sheds	(b) Average shed capacity	(c) Total farm capacity
Layers				
Pullets				
Hatchery only (give fertile egg numbers)				
Broilers (when birds present)				
Turkeys				
Ducks				

# 2.2. How would you describe the typical flow of live birds (or fertile eggs for hatcheries) on and off farm?

Please indicate (a) if the management for the poultry species is all-in-all-out OR if multiple age classes are present at the same time, (b) the average length of the production cycle (#) specifying the **time units** in days, weeks, or months (i.e. 42 days), and (c) the average time that sheds are left empty before new birds (or fertile eggs) are introduced (#) specifying the **time units** in days, weeks, or months (i.e. 1 week).

		w of birds ose one)	(b) Length of production cycle		(c) Downtime between cycles	
Species	All- in-all- out	Multiple age classes	#	Time units	#	Time units
Layers						
Pullets						
Hatchery only (give fertile egg numbers)						
Broilers						
Turkeys						
Ducks						

# 2.3. Which of the following best describes your (a) current housing type and (b) intended housing type to comply with regulatory changes by 2022.

	(a) Current	(b) Future
Free range housing		
Colony housing		
Barn housing		
I do not intend to produce after 2022		

#### 3. TRANSPORT COMPANIES

In this question, we are interested in knowing which transport companies and/or individuals have conveyed poultry or poultry related products (including eggs, feed, manure and dead birds) onto or off your farm during the past year.

For movements ONTO and OFF farm, please indicate the town or city of origin for the transporter (i.e. if Company A transported poultry from your farm to a processing plant and the company's depot was in Wanganui, list Wanganui as the address of origin of the transporter).

**3.1.** Please list the name and location details of individuals or companies that transported poultry or poultry-related product ONTO or OFF your farm over the last 12 months (in order of importance based on frequency of contacts). For part (d), please indicate the category number from the list below the table. For part (e), please indicate the average time interval between two consecutive contacts. For part (f), please indicate how much product is transferred with an average contact.

Example: <u>Transport company X from Wellington</u> transports <u>3000 adult birds</u> onto your farm once <u>every 40 days</u>.

(a) Name	(b) Direction of transport (select one)		of transport (town or city only)		(d) Category **	(e) Average time interval between two consecutive contacts		(f) How much poultry or poultry product is transferred?	
	Onto	Off			Time Interval	Units	Quantity	Units	
Example: Transport company X	Χ		Wellington	3	40	days	3000	birds	

**	<b>Categories</b>	include	those	who	trans	port
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(1) Feed.

(3) Day old chicks, pullets, and adult birds.

(5) Poultry product.

(7) Dead birds.

(2) Hatching eggs.

(4) Table eggs.

(6) Manure and litter.

(8) Broilers for slaughter

#### 4. FEED COMPANIES

In this question, we are interested in the origin of feed that is used on your farm and the destination of feed that might be sent from your farm to another location. In the majority of cases, there will only be a one-way flow of feed onto a farm. However, if feed is ever sold onwards or returned to a distributor, we would also like to know.

In each case, please indicate the town or city of origin (or destination) of the feed. For example, if you purchased feed from Company B whose depot was in Napier, give Napier as the address of the feed supplier.

**4.1.** Please list the name and location details of individuals or companies that moved feed <u>ONTO</u> your farm or received feed moved <u>OFF</u> your farm over the last **12** months (in order of importance based on frequency of contacts). For part (d), please indicate the category number from the list below the table. For part (e), please indicate the average time interval between two consecutive contacts. For part (f), please indicate how much product is transferred with an average contact.

Example: Feed company A from Nelson moves 20 tonnes of bagged feed onto your farm every 25 days.

(a) Name	(b) Direction of transport (select one)		(c) Origin or destination address (town or city only)	(d) Category **	(e) Average time interval between two consecutive contacts		(f) How much poultry or poultry product is transferred?	
	Onto	Off			Time interval	Units	Quantity	Units
Example: Feed company A	X		Nelson	2	25	days	20	tonnes

#### \*\* Categories include:

(1) Milled feed. (3) Home mix.

(5) Others

(2) Bagged feed.

(4) Combination of bought in and home mixed feed.

#### 5. LIVE BIRDS AND HATCHING EGGS

In this question we are interested in the origin of live birds (including day-old chicks and point-of-lay pullets) and/or hatching eggs that came onto your farm and the destination of live birds (including broilers for processing, end-of-lay birds) and/or hatching eggs were sent from your farm to another location.

**5.1.** Please list the name and location details of individuals or companies that moved live birds and/or hatching eggs ONTO your farm or received live birds and/or hatching eggs moved OFF your farm over the last 12 months (in order of importance based on frequency of contacts). For part (d), please indicate the category number from the list below the table. For part (e), please indicate the average time interval between two consecutive contacts. For part (f), please indicate how much product is transferred with an average contact. Example: 2500 adult broilers birds are moved to Processor Z in Hamilton from your farm every 42 days.

(a) Name (b) Direction o transport (select one)		sport	ort destination **		(e) Average tim between two contact	onsecutive	(f) How much poultry or poultry product is transferred?	
	Onto	Off	city only)		Time interval	Units	Quantity	Units
Example: Processor Z		Χ	Hamilton	4	42	days	2500	birds

**	Catego	ories	incl	ude
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1) Hatching eggs. (2	۷)	Da
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y old chicks. (3) Pullets.

<sup>(4)</sup> Adult birds.

#### 6. TABLE EGGS AND POULTRY PRODUCTS

In this question we are interested in the origin of table eggs and/or poultry product (e.g. dressed chickens) that came onto your farm and the destination of table eggs and/or poultry product that was sent from your farm to another location.

**6.1.** Please list the name and location details of individuals or companies that moved table eggs and/or poultry products ONTO your farm or received table eggs and/or poultry products moved OFF your farm over the last 12 months (in order of importance based on frequency of contacts). For part (d), please indicate the category number from the list below the table. For part (e), please indicate the average time interval between two consecutive contacts. For part (f), please indicate how much product is transferred with an average contact. Example: 10 kg of poultry feathers are moved to Processor ABC in Wellington from your farm every 3 months.

(a) Name	of tra	rection nsport t one)	(c) Origin or destination address (town or city only)	(d) Category **	(e) Averag interval betv consecutive	veen two	poultry	ich poultry or product is ferred?
	Onto	Off			Time interval	Units	Quantity	Units
Example: Processor ABC		Х	Wellington	3	3	months	10	kg

**	Catego	ories	inc	lude
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(1) Table eggs.

(2) Poultry product.

(3) Feathers and/or offal

#### 7. REGULAR MOVEMENTS OF PERSONNEL

In this question, we are interested in the movement of people associated with the poultry industry onto your farm and the destination of permanent members of your farm staff to other locations where poultry are present. We are not interested in details of every single movement, only those that occur on a regular basis (e.g. routine visits by advisors, contractors, and personnel from other premises where poultry are kept).

**7.1.** Please list the name and location details of those permanent staff members who made an <u>ON FARM</u> or <u>OFF FARM</u> visit to other locations where poultry were present over the last 12 months (in order of importance). For part (a), please indicate the category number from the list below the table. For part (c), please indicate the average time interval between two consecutive contacts.

Example: A <u>veterinarian</u> based in <u>Tauranga</u> visits your farm for regular health inspections <u>once every month</u>.

(a) Category**	(b) Origin or destination address	(c) Average to between two	
	(town or city only)	conta	acts
		Time interval	Units
Example: 1	Tauranga	1	month

#### \*\* Categories include:

- (1) Veterinarians, advisors, industry representatives.
- (2) Contractors (those having direct contact with poultry sheds or equipment e.g. cleaning and maintenance crews).
- (3) Permanent employees on your farm
- (4) Individuals from premises where commercial poultry are kept.
- (5) Individuals from premises where non-commercial poultry are kept.

#### 8. NEW LITTER, MANURE/USED LITTER, AND DEAD BIRDS

In this question, we would like to know about the movement of manure/used litter, and dead birds to and from your farm. In the majority of cases, there will be a one-way flow of manure/used litter and dead birds off the farm, but there may also include the movement of new litter to the farm. We use the term "dead birds" here to refer to those birds that have died on site.

**8.1.** Please list the name and location details of individuals or companies that moved new litter, manure/used litter, or dead birds ONTO your farm or new litter, manure/used litter, or dead birds moved OFF your farm over the last 12 months (in order of importance). For part (d), please indicate the category number from the list below the table. For part (e), please indicate the average time interval between two consecutive contacts. For part (f), please indicate how much product is transferred with an average contact.

Example: 100 kgs of manure are moved to Company ABC of Napier from your farm every 45 days.

(a) Name	(b) Dire of tran (select	sport	(c) Origin or destination address (town or city only)	(d) Category **	(e) Averag interval betw consecutive	veen two		uch product sferred?
	Onto	Off			Time gap	Units	Quantity	Units
Example: Company ABC		Χ	Napier	2	45	days	100	kg

** Categories include	e
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(1) Dead birds.

(2) Manure /used litter.

(3) New Litter

## 9. BIOSECURITY RISKS

9.1. Please answer the following	-	bout th	e worke	ers on your	farn	า.	
How many full-time workers are I	oresent?						
How many part-time workers are	present?						
Workers are assigned to (select o	ne):	□ Wh	ole farn	<b>1</b> [	∃ Spe	ecific she	eds
9.2. Which of the following biose	curity meas	sures ar	e imple	mented on	you	r proper	ty?
Please indicate how frequently th	-		-		•		•
		Never	Rarely	Sometim	es	Often	Always
Vehicle disinfection before enteri	ng farm						
Dedicated clean coveralls for each	h shed						
Dedicated boots or boot covers w	orn for						
each shed							
Footbaths at shed entrances							
Monitored rat and mouse bait sta	ations						
Bird-proofed housing							
Bird-proofed feed storage							
9.3. Which of the following equip	oment is sha	ared wit	h other	farms?			
Choose all that apply. For part (b					eauir	oment is	
cleaned and disinfected between	· ·				-1- 1		
		(a	1)	(b) Is the e	quip	ment	
		Equip	ment	cleane	d an	d	
				disinfected	bet	ween	
				farn	ns?		
Vehicles and trailers			]	□ No	□ Ye	es	
Gates and panels			]	□ No	□ Ye	es	
Lawn mowers			]	□ No	□ Ye	es	
Pressure sprayers / washers			]	□ No	□ Ye	es	
Skid steer loaders (tractors with b	ouckets for		]	□ No	□ Y6	es	
cleaning out sheds)							
_ ,							
Other equipment			]	□ No	□ Ye	es	
_ ,			]	□ No	□ Y6	es	
_ ,	questions a						
Other equipment	-						
Other equipment  9.4. Please answer the following	-	bout th					
Other equipment  9.4. Please answer the following Select ONE option for each quest	ion	bout th					
9.4. Please answer the following Select ONE option for each quest What is the main source of	ion Town su	bout th					
9.4. Please answer the following Select ONE option for each quest What is the main source of drinking water for poultry on	ion □ Town su □ River	pply	e water				
9.4. Please answer the following Select ONE option for each quest What is the main source of drinking water for poultry on	on □ Town su □ River □ Bore	pply	e water				
9.4. Please answer the following Select ONE option for each quest What is the main source of drinking water for poultry on your farm?  How is the drinking water	ion  ☐ Town su ☐ River ☐ Bore ☐ Other, r	pply blease sp	e water				
9.4. Please answer the following Select ONE option for each quest What is the main source of drinking water for poultry on your farm?	on  ☐ Town su ☐ River ☐ Bore ☐ Other, p ☐ No treat ☐ Chlorine	pply please sp	e water				
9.4. Please answer the following Select ONE option for each quest What is the main source of drinking water for poultry on your farm?  How is the drinking water	ion  ☐ Town su ☐ River ☐ Bore ☐ Other, r	pply please spending dioxide	ne water				

9.5. Please answer the fol	lowing auestior	ns abo	ut litter	manage	ement o	n vour f	arm.	
What type of litter do you		450	30 110001	aiiag		,	J	
Is a litter shed present?	use:	□ No				 ⊐ Yes		
How often are the sheds c	loaned out?		tially af	ter each		⊒ Fully a	ftor oac	h run
What disinfectant do you (		⊔ Fai	cially at	ter each	Tull	⊒ i uliy a	itel eac	.ii i uii
How moist is the litter?	ise:	□ To:	dnı	□ Abou	t riaht	□ Too	ot	
	+2	□ Too	ury	□ Abou			wet	
Do you use litter treatmen	t:			⊔ 1es, µ	olease sp	ecity.		
9.6. Do you see wild birds	or waterfowl (a	a) in th	ne same	area as	poultry	e.g. wi	thin sh	eds o
within ranges on free-rang farm? If you do have pond	ge operations) o	or (b) (	on any p	onds o	r waterv	vays pre	sent on	
distance of the ponds or w	vaterways from	the p	oultry s	heds?		 -		
	(a) In the sa		` '	On pon		1	pproxir	
	area as poul	itry?	wate	erways			nce of	•
				farm?			iterway ds (met	
Wild birds	□ No □ Y	⁄es	□ No	□ Yes	□ NA*			
Waterfowl	□ No □ Y	⁄es	□ No	□ Yes	□ NA*			
	* I do	not ha	ve any p	onds or	waterwa	ys presen	nt on the	farm
	(a)			(b)				
•	(a)			(b)				
Starling								
Starling								
Starling Sea gull								
Sparrow Starling Sea gull Duck Others (please specify):						-		
Starling Sea gull Duck Others (please specify):		ns abo	ut conta		backya	rd (non-	comme	rcial)
Starling Sea gull Duck Others (please specify): 9.7. Please answer the fol		ns abo	ut conta		backya			
Starling Sea gull Duck Others (please specify):  9.7. Please answer the folepoultry operations.	lowing question			act with		No	Yes	NA
Starling Sea gull Duck Others (please specify):  9.7. Please answer the foleoultry operations.  Do point-of-lay birds get se	lowing question	ackyaı	rd flocks	act with	our farm	No 1? □	Yes	NA □
Starling Sea gull Duck Others (please specify):  9.7. Please answer the foleoultry operations.  Do point-of-lay birds get soleoned	lowing question	ackyaı ckyard	rd flocks flocks f	act with	our farm ur farm?	No 1? □	Yes	NA
Starling Sea gull Duck Others (please specify):  9.7. Please answer the foleoultry operations.  Do point-of-lay birds get soleoultry birds get soleoultry many independently-	lowing question  old directly to be directly to bacowned backyard	ackyaı ckyard	rd flocks flocks f	act with	our farm ur farm?	No 1? □	Yes	NA 🗆
Starling Sea gull Duck Others (please specify):  9.7. Please answer the foleoultry operations.  Do point-of-lay birds get soleoultry birds get soleoultry operations.  How many independently-farm (i.e share a farm bout)	lowing question  old directly to be directly to backyard owned backyard odary)?	ackyar ckyard d flock	rd flocks flocks f ss are ac	act with	our farm ur farm? o your	No 1?	Yes :: *	NA □
Starling Sea gull Duck	lowing question  old directly to be directly to backyard owned backyard odary)?	ackyar ckyard d flock	rd flocks flocks f ss are ac	act with	our farm ur farm? o your	No 1?	Yes :: *	NA □

## **10. ADDITIONAL FEEDBACK**

	are you about the following poultry health issues on your farm?  Not at all Slightly Somewhat Moderately Extremely						
	Not at all			1	_		
	concerned	concerned	concerned	concerned	concerned		
Campylobacter							
Salmonella							
Avian influenza							
Coccidiosis							
Antibiotic resistance							
Welfare							
Comments:							
10.2. What would you	describe as the	higgest conce	rn facing you	r farm?			
10.2. Wilat would you	describe as the	Diggest conce	iiii iaciiig you	ı lallır			
			<u>U ,</u>	- 10:::1::0			
			0,				
10.2 What areas of fu	turo rosoarch w						
10.3. What areas of fu	ture research wo				?		
10.3. What areas of fu	ture research wo				?		
10.3. What areas of fu	ture research wo				?		
10.3. What areas of fu	ture research wo				?		
10.3. What areas of fu	ture research wo				?		
10.3. What areas of fu	ture research wo				?		
10.3. What areas of fu	ture research wo				?		
10.3. What areas of fu	ture research wo				?		
10.3. What areas of fu	ture research wo				?		
10.3. What areas of fu	ture research wo				?		
		ould have the	most benefit		?		
10.3. What areas of fu		ould have the	most benefit		?		

## **Thank You!**

We greatly appreciate your time in filling out this survey.







