

RISK TRANSFER PROGRAM ANALYSIS BC POULTRY

COVERAGE OPTION REVIEW

26 JULY 2017

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Introduction

In the concept paper dated March 15, 2017 titled *Risk Transfer Program Analysis* the following items were outlined as needed steps in establishing a risk transfer program responding to cleaning and disinfecting costs (C&D) caused by Notifiable Avian Influenza (NAI) outbreak. In the conclusion, these required next steps were listed:

- i) Select best suited risk bearing vehicle (Group Funded Deductible or Captive)
- ii) Design and develop primary program coverage
- iii) Analyse historic losses to develop an annual expected loss
- iv) Develop base primary rate inclusive of overhead and fund balance growth targets
- v) Explore reinsurance options to respond to pre-determined risk appetite and financial liquidity mandates

The selection of a best-fit risk bearing vehicle – item i) above – will be decided upon by the various contributing producer groups. This decision has both capital and regulatory implications and the right risk-bearing vehicle needs to be selected by the parties who will be operating and serviced by it.

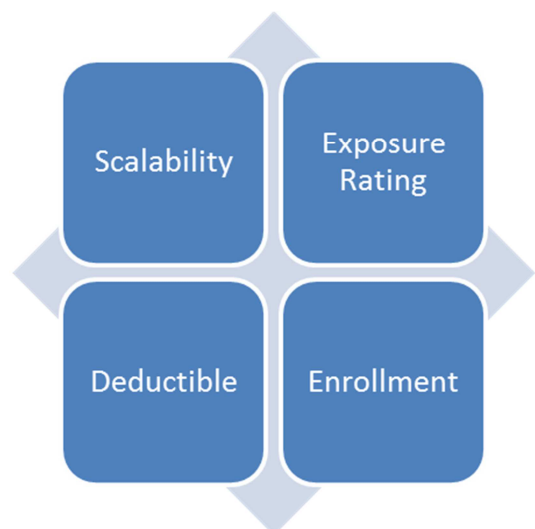
This report will address the second step being “Design and develop primary program coverage”. It will first look at the Primary Rating Components required for any insurance product and will then review four options for consideration. Reference to BC poultry market statistics will be used in order to develop a recommendation for the program structure.

The analysis will remain focused on what aspects need to be addressed in the product to ensure that the product can be adequately underwritten - meaning that risks can be assessed on their various beneficial or disparaging qualities and charged accordingly. By ensuring fair rating criteria is in place, the program will mitigate anti-selection and will have a better opportunity to provide coverage to every producer at the right price.

Following the above, we define what anti-selection is and how it can be mitigated in the program through the incorporation of the following aspects:

- Scalability to operation size
- Exposure rating (i.e. type of bird)
- Utilization of a deductible, and
- Enrollment rate (mandatory or voluntary)

After these characteristics are addressed, we will then compare four potential program structures to see how each respond to the aforementioned criteria. By tabulating the results, a best-fit program can be determined for utilization in items iii) and iv) listed under the next steps above.



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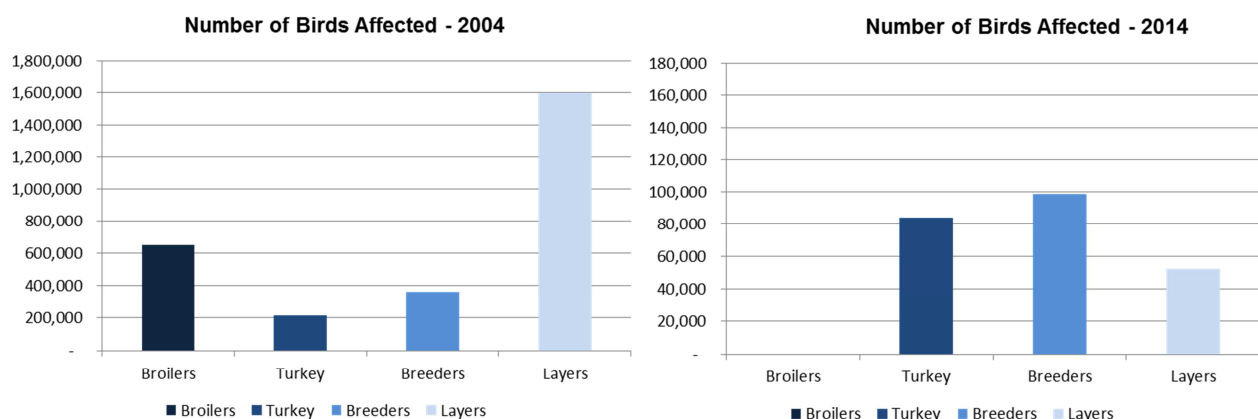
Description of Primary Rating Components

In the previous section the term anti-selection was referred to. “Anti-Selection”, sometimes called “Adverse Selection”, is a concept in economics, insurance, and risk management, which describes a situation where market participation is affected by asymmetric information or when buyers and sellers have different information. Insureds with better private information about their exposure to loss will selectively participate in programs which benefit them the most, usually at the expense of the insurer.

Insurance products have evolved to address anti-selection via the introduction of processes to identify and rate components of risk accordingly. In order for the NAI program to be sustainable and offer a long term platform of protection for BC Poultry producers, anti-selective qualities pertaining to the insured risk must be identified and contained. Fortunately - with the use of rating methods pertaining to size and risk quality – the impact resulting from anti-selection can be addressed. This is further enhanced if the enrollment rate can be maximized via mandatory participation which will be discussed under a separate section.

Scalability to Operation Size

It is crucial that the program offered is scalable to the operation size. This will enable the program to provide the necessary coverage on a custom level to each and every participant in the program. By referring to data collected following the 2004 and 2014 NAI outbreaks it becomes apparent that there can be a wide range in the number of birds affected depending on where the outbreak occurred and what operations were impacted. The charts inset below illustrate the number of each type of bird affected and it is apparent that the *Layers* sector was the hardest hit by having almost three times the number of birds affected. Note: The table is an accurate reflection of the number of birds compensated for ordered destruction in 2004. Not all of the birds were in premises that tested positive for AI and as a result the numbers that potentially would have been compensated for enhanced C&D would have been less. Using this loss as an example, if all of the affected birds were at one production site it would be critical to have a product that offers sufficient coverage for that producer. Coverage must have the ability to be tailored to differently sized operations.

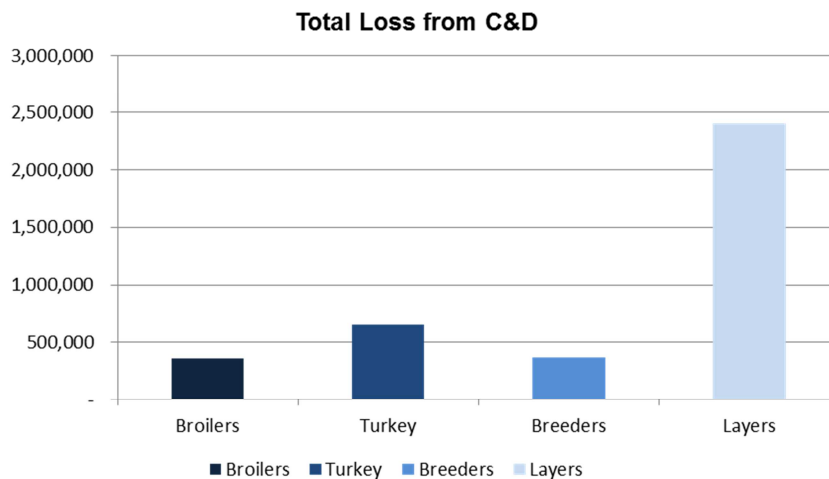


Exposure Rating

The second aspect to be discussed is the ability for the program to respond to the different classes of exposure in the program. Within the proposed program the exposure is best identified by the type of bird being covered. For discussion purposes the following diagram illustrates the four bird classes by which the exposure can be allocated.



Within these four classes there are some common characteristics between groups. Broilers and Turkeys are considered “meat birds” while Breeders and Layers are referred to as “long cycle”). For purposes of this report, the distinguishing factor between the two groups is the duration that the bird spends in the barn. The “risk of infection” increases with the amount of time spent in the barn. The higher exposure warrants consideration in the rate calculation for each bird class.



However, the two broad categories of “meat birds” and “long cycle” do not sufficiently capture all of the risk characteristics for each bird type. This is apparent by looking at the average C&D cost per bird for each of the four classes. For example, although Turkeys spend less time in the barn than Breeders, Turkeys have generated higher C&D costs than Breeders which spend considerably more time in the barn.

	Number Affected	C&D Loss per Bird (\$)	Total Loss (\$)
Broilers	-	N/A	-
Turkeys	87,482	2.50	218,705
Breeders	98,450	2.13	209,815
Layers	53,214	4.82	256,325

Another factor affecting C&D exposure is the size and type of barn and equipment. The more equipment within the barn, the greater time will be spent on C&D.

These observations indicate that each bird type has unique qualities that should be considered in the development of exposure classes – further reinforcing that four risk classes are needed.

Utilization of a Deductible

The size of the loss must be meaningful from the perspective of the insured. Insurance premiums need to cover: the expected cost of losses; the cost of issuing and administering the policy; adjusting losses; and supplying the capital needed to reasonably assure that the insurer will be able to pay claims. It doesn't serve any party in the agreement to have smaller, attritional losses processed. These losses increase administrative costs and unnecessarily burden the claims handling system and premium rate.

By utilizing a deductible, these attritional losses will not be covered and the administrative cost burden will be removed from the program. Consideration needs to be given to how the deductible level is set. Every consideration that was addressed as part of the insured exposure – resulting from scalability and class of risk – needs to be factored into the deductible to ensure no dislocation occurs. Listed below are some deductible options for consideration:

- i) Based on number of birds affected (per head)
- ii) A dollar amount per head of affected bird
- iii) Total loss amount in dollars
- iv) Percentage of operation impacted

Dependent on the actual program structure, one or all of the deductible options above could be sourced for the program. However, the perceived impact of the deductible by the insured will impact the enrollment rate which brings us to the last rating component.

Enrollment Rate

Enrollment does not impact the rating criteria as much as the aforementioned items. However it is important in the sustainability of the program on both a funding and data sourcing platform.

To achieve a higher degree of enrollment, the prospective insured must see value in the coverage being offered. The most immediate value proposition is determined by whether or not the premium is considered reasonable on a risk-reward basis, and then is it affordable? If the likelihood of an insured event is so high, or the cost of the event so large, that the resulting premium is large relative to the amount of protection offered, then it is not likely that the insurance will be purchased. By not having sufficient enrollment, the program will not generate a sustainable volume of premium to pay for losses.

To appeal to prospective participants, the product should be able to cater to the specific needs of each potential insured. The required approach has been previously discussed in that the product will need to have the capability to adjust the retention/deductible, limit and premium/rate to best fit the exposure being covered. This customization could be mitigated somewhat if mandatory enrollment is sought.

Mandatory Enrollment

From a pure insurance standpoint, having every member of the participating associations required to participate would provide a larger pool of premium and comprehensive producer level data which could be utilized to enhance most – if not all – aspects of the program. With a mandatory enrollment, the program could not be anti-selected against due to all members being required to participate. Considering the reduction in anti-selection, the program will also benefit from reduced volatility and will become sustainable in a shorter time when compared to a program with optional enrollment. The reduction in volatility is also further mitigated due to the increased size of the program base and the more homogeneous spread of risk.

Governing protocols will need to be utilized to ensure that every poultry producer contributes to the pool. This may require additional resource to develop a compliance system that can determine which producers have contributed and which have not. On the other hand this capability may already be largely embedded in the existing quota management system. Relatively recent changes in authority enabling various boards and commissions to impose mandatory enrollment have removed barriers that previously stood in the way of mandatory participation. Further enhancement could occur if other authoritative bodies (i.e. AAFC and BCMA) indicate that no “Agri-Recovery” payments will be remitted for C&D losses which would direct producers towards enrolling into this program.

Regardless of whether the program has mandatory enrollment or not, care must be taken to ensure that the value proposition is maintained so that participation is deemed beneficial to – at minimum – the majority of its members. If enrollment is not made mandatory, then the benefits offered in the coverage will need to be structured in such a way that the program is sustainable and attractive to potential insureds.

In summary, the criteria discussed in this section will serve to grade the program coverage options that will be discussed in the next section.

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Discussion of Program Coverage Options

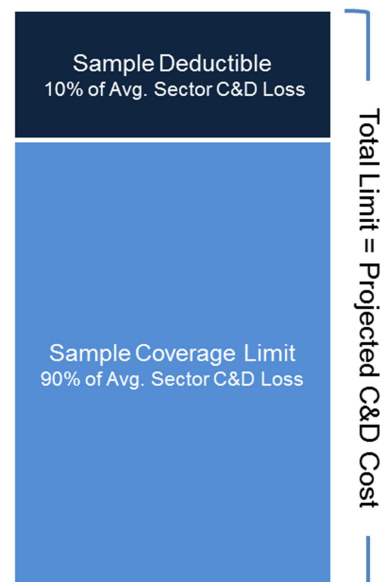
This section will review four coverage options for the C&D losses component resulting from a NAI outbreak and rank each according to the four rating components discussed under Section 2. The four coverage options are as follows:

- i) Percentage of total loss
- ii) Fixed aggregate dollar value
- iii) Fixed dollar value per bird
- iv) Fixed dollar value per bird with additional percent of loss for excessive costs

This analysis uses a grading scale from 1 to 4 with 1 being “not very capable” and 4 being “very capable”.

Coverage Option 1 – Percentage of C&D Cost

This coverage option would respond on an excess of loss basis which indemnifies the insured up to a specific percentage of the total loss after the initial deductible is exhausted. Benefits under this cover are that recovery can be made for relatively small claims and, depending on the amount of the coverage bought, can protect to a meaningful degree. The coverage is based on a market average that would be applied to each respective producer independent of their operation size. For the purposes of this analysis the program structure will be set at coverage equating to 90% of the average C&D cost with a 10% deductible shown in the diagram inset right.



A challenge with this option is that both the limit and deductible will need to be defined in a broadly accepted manner potentially via the average C&D losses by sector. Due to the limited historical data available on costs of C&D, use of existing data to establish sector averages would result in \$0 for broilers; ~\$73,000 for turkeys; \$30,000 for breeders; \$250,000 for layers. Using this as the basis for determining coverage does not take into consideration that there may be unique instances (size of operation) that cannot be generalized and could leave the producer with either too much - or not enough - cover. Additional considerations and factors impact a producer’s bottom line such as efficiencies in operations through good management (in addition to mandatory biosecurity measures). Such factors impact the potential loss and would not be incorporated into the average coverage and rate. If they were, challenges as to how guidelines should be set arise.

This coverage option could be attractive to producers for the breadth of cover offered and potential responsiveness dependent on the deductible level. However, there are meaningful challenges in developing the exposure rating model and there is concern around the scalability in cases where the operation sees material inter-year and/or intra-year growth.

How the rating and scalability are addressed will directly impact the level of anti-selection inherent to the program. Concrete parameters for underwriting guidelines would be required. In light of these items, this option would be rated as shown at the top of the following page.

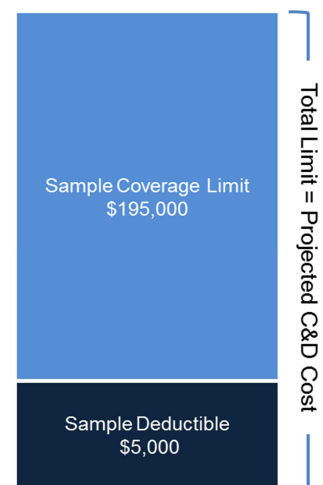
Coverage Option	Scalability	Exposure Rating	Deductible	Enrollment
Percentage of Total Loss	1	2	3	3

Summary:

- Scalability – “not very capable”, due to non-correlation of cost of C&D to operation size
- Exposure – “somewhat capable”, due to non-correlation of costs to exposure (i.e. bird type)
- Deductible – “capable”, due to difficulty in determining proper level
- Enrollment – “capable”, due to producers having to only provide evidence of IP declaration

Coverage Option 2 – Fixed Dollar Value

This coverage option would respond on an excess of loss basis that would indemnify the insured up to a specific dollar amount of total loss after the initial deductible is exhausted. Benefits under this cover are that both limit and deductible amounts can be easily changed year-over-year and that the program has an easily identified attachment point. This differs slightly in operation from option 1 as under that program the loss was generated from drops in revenue whereas this program responds to increases in actual loss amounts.



Again, no base line data exists to underwrite the risk which will hinder the establishment of a definite limit and deductible that there is no mandated scalability. A large producer could purchase a nominal amount of cover leaving the operation exposed to a large loss and smaller producers could increase the deductible (reducing the cost of the program) and move the program further away from recovery.

This inherent flexibility is attractive to buyers who are sophisticated enough to properly assess the amount of coverage required thereby avoiding capacity charges for limit at the top of the program that in most cases will be unused. Additionally, the program operation is more standardized and therefore more readily understood by potential clientele. As was the case for option 1, issues surrounding rate and scale will directly impact the level of anti-selection inherent to the program. Without concrete parameters to establish underwriting guidelines this option would be rated as follows:

Coverage Option	Scalability	Exposure Rating	Deductible	Enrollment
Fixed \$ Value	1	1	4	3

Summary:

Scalability – “not very capable”, due to potential of coverage to operation size

Exposure – “not very capable”, due to non-correlation of cost to exposure (i.e. bird type)





Deductible – “very capable”, due to incorporation of a defined dollar amount

Enrollment – “capable”, due to producers having to select deductible and limit amounts

Coverage Option 3 – Fixed Dollar Value Per Bird

Whereas under options 1 and 2 the coverage offered was dependent on actual dollars spent on C&D, the basis of risk for the next two coverage options will be based on the number and types of poultry being insured.

Referring to the charts included in Section 2, each class has quantifiable characteristics specific to each bird type. Therefore by designing a coverage that addresses these specifications the coverage offered becomes scalable and ratable accordingly to the exposure. A major requirement for this type of coverage is that analysis would have to be performed to establish that the proper amount of coverage is being provided on a per bird basis and that adequate rate is being charged. Both of these criteria can be determined via analysis of the historic loss occurrences. For discussion purposes C&D values have been selected for each class of bird as indicated in the diagram inset above right. In addition, it will be assumed that the insured producer has 1,000 birds in each respective class.

	Broilers Insured Value = \$1/bird Rate = \$0.05 /bird
	Turkeys Insured Value = 1.63/bird Rate = \$0.50 /bird
	Breeders Insured Value = \$2/bird Rate = \$0.70 /bird
	Layers Insured Value = \$3/bird Rate = \$0.50 /bird

Coverage for this insured would be as follows:

Class of Bird	Number of Birds	Total Coverage	Total Premium
Broilers	1,000	\$1,000	\$45
Turkeys	1,000	\$1,630	\$500
Breeders	1,000	\$2,000	\$700
Layers	1,000	\$3,000	\$500
Total	4,000	\$7,630	\$1,750

There are two ways in which a deductible can be introduced if so desired. The first is via the standard application as shown in Coverage Option 2 whereby the loss must exceed a prescribed aggregate dollar amount. Rate should decrease as the deductible amount increases which could incent producers to take higher deductibles in order to achieve greater savings.

The second method of incorporating a deductible is by imbedding it in the coverage offered on a per bird basis. This would be the preferred method from an underwriting standpoint as it is fully customizable to each sector particular needs and exposure characteristics. For example, broilers have a comparatively nominal C&D exposure so the deductible could be set lower than the other sectors.

Referring back to the table above, by introducing a 10% deductible per bird across each class, both coverage and premium would also be impacted (assumed a 10% reduction for both coverage and rate). This impact is shown in the example at the top of the following page:

Class of Bird	Number of Birds	Deductible	Total Coverage	Total Premium
Broilers	1,000	\$100	\$900	\$40
Turkeys	1,000	\$163	\$1,467	\$450
Breeders	1,000	\$200	\$1,800	\$630
Layers	1,000	\$300	\$2,700	\$450
Total	4,000	\$2,000	\$5,630	\$1,570

The remaining consideration is how this program would resonate with prospective insureds. Given that it adjusts its costs according to size and risk, the program provides coverage on a fairer basis which should enlist some enrollment. The key criteria to generate participation will be how the rating for each class of bird is received by producers however if the program participation becomes mandatory this criteria's importance reduces significantly.

With all of the above being considered, the rating for this coverage option would be as follows:

Coverage Option	Scalability	Exposure Rating	Deductible	Enrollment
Fixed \$ value/bird	4	4	4	3

Summary:

Scalability – “very capable”, due to the coverage being directly related to operation size

Exposure – “very capable”, due to correlation of exposure (i.e. bird type) to premium charged

Deductible – “very capable”, due to multiple ways of incorporation (direct or imbedded)

Enrollment – “capable”, due to producers being less able to anti-select against the program

Coverage Option 4 – Fixed Dollar Value Per Bird + % of Loss of Excessive Eligible Costs

This coverage option is identical to what was presented under option 3 but with a component of additional coverage for excessive eligible costs. These additional costs would result from demand surge type charges whereby contracted cleaners would charge additional – above market – rates resulting from the surplus demand for their services.

Whilst this additional coverage is welcome, challenges become apparent when considering the impact to both the rating model and loss adjustment of the program.

First, the impacts to the rating model will be addressed. Given the lack of credible data available on the frequency and severity of losses arising from this additional cost, the only way a rating model can incorporate payments for this peril is by applying a generic load to the technical loss rate that is developed from actual losses. This method will prove punitive to insureds as the load will need to account for a meaningful amount of uncertainty that will increase the rate charged for the cover.

When shifting focus to the loss adjustment of the claim, only those producers who embrace these additional costs will see benefit from this feature. By not operating with a cost-sensitive mindset, considerable anti-selection is introduced to the program via this additional coverage which will negatively impact the overall performance of the program.

This behaviour also applies to the deductible of the program. By having additional anti-selective qualities in the program, more adverse risks will be incented to purchase coverage. With more adverse risk in the program the deductible will be dislocated from the true level and will either be too high for properly assessed risk or too low for understated risk.

With the uncertainty loads impacting the cost of the program, enrollment will be less than seen under coverage option 3 due to the program being more expensive.

Considering the uncertainty on how to properly account/rate for the excessive eligible costs, the overall ratings are lower than those presented under coverage option 3.

Coverage Option	Scalability	Exposure Rating	Deductible	Enrollment
Fixed \$ value/bird + add'l	4	3	2	2

Summary:

- Scalability – “very capable”, for same reasons as presented under coverage option 3
- Exposure – “capable”, due to uncertainty introduced from additional excessive costs
- Deductible – “somewhat capable”, resulting from reduced accuracy of the deductible level
- Enrollment – “somewhat capable”, due to enrollment decline resulting from increase in rate

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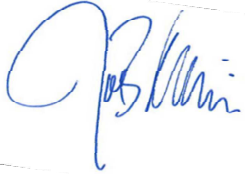
Summary

This report has identified four rating components and has applied them to four separate and unique structures. The table inset below summarizes the findings for each program by each rating component:

Coverage Option	Scalability	Exposure Rating	Deductible	Enrollment
1. % of Total Loss	1	2	3	3
2. Fixed \$ Value	1	1	4	3
3. Fixed \$ value/bird	4	4	4	3
4. Fixed \$ value/bird + add'l	4	3	2	2

By being able to properly adjust for both scalability and exposure and also include two methods for incorporation of a deductible, Coverage Option 3 has the highest ratings. By having a fair platform to assess total risk this coverage option doesn't dissuade producers from enrolling as a result of anti-selection and actually promotes enrollment due to the customizable features of the program. Additionally, via a simple adjustment advice (i.e. number of birds by type) the coverage is easy to apply for and even more easily adjusted at the time of loss. Based on this reasoning Coverage Option 3 is best suited for exploration and rate development as specified under items ii) to iv) of the next steps in program development.

If any further detail is required please do not hesitate in contacting us directly.



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