

# Cost of Disease Calculator Model

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*User Guide*

Prepared for  
**Ontario Veal Association**



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# 1 User Data

The following sections identify: (1) farm records that are likely to contain the information that you will need when entering your data; (2) how the data entry sheets are organized; (3) definitions and guidance regarding the actual data entry fields.

## 1.1 Records Needed

- Animal inventory
- Animal purchase records
- Feed purchase records
- Production records (breeding, reproduction, birth, milk)
- Animal sales records
- Milk sales records
- Veterinary and animal health product invoices

## 1.2 Data Collection Sheets

One unique form for every production sector divided into three sections:

1. Breeding production records

5	BREEDING	Actual
6	Number of breeding females	1
7	Number of breeding males	1
8	Average number of days between parturition and breeding	
9	Number of females bred	1
10	Number tested pregnant	
11	Number of aborted female breeders	1
12	Number of culled female breeder	
13	Number of dead female breeders	
14	Value of culled female breeder	
15	Replacement value per female	
16	Number of culled male breeder	
17	Number of dead male breeders	
18	Value of culled male breeder	
19	Replacement value per male	
20		
21	Number born	1
22	Number born alive	
23	Average birth weight (lbs)	
24	Number culled	
25		
26	Number weaned / marketed	
27	Average weaning / market age (days)	
28	Average weaning / market weight (lbs)	
29	Value at weaning / market (\$/lb)	
30		
31	Feed consumed (tonnes)	
32	Feed cost (\$ total)	
33	Health (Vacc, Med, Veterinary cost - \$ total)	

## 2. Meat production records

63	MEAT	Actual
64	Number entered	1
65	Average cost per animal entered (\$)	
66	Average entry weight (lb)	
67	Number culled	
68	Number marketed	
69	Days from entry to market	
70	Average live market weight (lb)	
71	Value at market weight (\$/lb live)	
73	Feed consumed (tonnes total)	
74	Feed cost (\$ total)	
75	Health (Vacc, Med, Veterinary cost - \$ total)	
76	Cost of gain - given (\$/lb)	

farm data entry calculations +  
Normal View Ready

## 3. Milk production records

92	MILK	Actual
93	Number of females lactating	
94	Average lactation duration (days)	
95		
96	Average milk production (kg/F/day)	
97	Milk value (\$ per kg)	
98		
99	Feed consumed (tonnes total)	
100	Feed cost (\$ total)	
101	Health (Vacc, Med, Veterinary cost - \$ total)	

farm data entry calculations +  
Normal View Ready

Every animal species uses the same form according to what the farm produces. So terminology may differ from certain of the production-specific terms. The collection sheet was discussed with a few beef, veal, sheep, goat, and rabbit producers and they found the terminology for the most part intuitive.

Data requested is usually readily available to most producers. **If the information is not available, leave the cell blank.**

### 1.3 Definitions and Data Entry Guidance

Breeding	
Number of breeding females	Number of females of breeding age
Number of breeding males	Number of males used for breeding
Average number of days between parturition and breeding	Average number of days between parturition and successful breeding
Number of females bred	Number of females presented to the male or

	inseminated
<b>Number tested pregnant</b>	Number of females confirmed pregnant
<b>Number of aborted female breeders</b>	Number of females giving birth prematurely to a non viable foetus
<b>Number of culled female breeder</b>	Number of females removed (sold, butchered) from the herd/flock during the period analyzed from which some revenue was generated
<b>Number of dead female breeders</b>	Number of females dead or euthanized during the period analyzed
<b>Value of culled female breeder</b>	Dollar value per culled female sold
<b>Replacement value per female</b>	Dollar paid or value of replacement female brought into the breeding herd/flock
<b>Number of culled male breeder</b>	Number of males removed (sold, butchered) from the herd/flock during the period analyzed from which you got some revenue
<b>Number of dead male breeders</b>	Number of males dead or euthanized during the period analyzed
<b>Value of culled male breeder</b>	Dollar value per culled male sold
<b>Replacement value per male</b>	Dollar paid or value of replacement male brought into the breeding herd/flock
<b>Number born</b>	Total born including those that were born dead
<b>Number born alive</b>	Total number of offspring that were born alive
<b>Average birth weight (lbs)</b>	Average birth weight in pounds
<b>Number culled</b>	Number of offspring that were removed (debilitated, sick) from the herd/flock during the period analyzed (mortality is calculated and is equal to the number weaned/marketed minus the number culled minus the number born alive).
<b>Number weaned/marketed</b>	If you have an operation where you keep the offspring past weaning you have the choice to enter final market data here. For a more accurate estimate of the cost of disease on your operation, we encourage you to write down the number weaned here and to enter the same number as "number entered" in the MEAT section of the form.
<b>Average weaning/market age (days)</b>	Age at market, or preferably age at weaning.

<b>Average weaning/market weight (lbs)</b>	Live market weight or preferably live weaning weight. If you retain the offspring enter the same number in the “average entry weight” in the MEAT section of the form.
<b>Value at weaning/market (\$/lb)</b>	Live price per pound received. If you retain the offspring use the same weaning \$/lb value to calculate the “average cost per animal entered” in the <b>Meat</b> section of the form.
<b>Feed consumed (tonnes)</b>	Total amount of feed consumed in metric tonnes. May also include any farm-produced feedstuff that was fed to the animals.
<b>Feed cost (\$ total)</b>	Sum of all of the feed bills for the breeders. May also include any farm-produced feedstuff that was fed to the animals. If you are not separating feed cost between feed fed to breeding and weaned animals, either enter the total cost here or in the <b>Meat</b> section. If you are primarily breeding for the purpose of selling milk, then enter all of the feed cost in the <b>Milk</b> section and leave this cell blank. You may also choose to allocate a portion of the total amount to each section.
<b>Health (Vacc, Med, Veterinary cost - \$ total)</b>	Sum of the veterinary and medication bills for vaccines, antimicrobials, hormones, etc.

<b>Meat or Replacement Breeding</b>	
<b>Number entered</b>	Number of animals entered whether sourced from an outside supplier or your farm
<b>Average cost per animal entered (\$/animal)</b>	Price paid per animal entered or transfer price from the breeding operation (i.e. price charged to yourself)
<b>Average entry weight (lb)</b>	Weight of the animals at entry or at weaning
<b>Number culled</b>	Debilitated or sick animals removed from the herd/flock
<b>Number marketed</b>	Number of animals sold
<b>Days from entry to market</b>	Average time from entry to market in days.
<b>Average live market weight (lb)</b>	Live weight
<b>Value at market weight (\$/lb live)</b>	Live price per pound
<b>Feed consumed (tonnes total)</b>	Total amount of feed consumed in metric

	tonnes. May also include any farm-produced feedstuff that was fed to the animals.
<b>Feed cost (\$ total)</b>	Sum of all of the feed bills for the weaned/growing animals. May also include any farm-produced feedstuff that was fed to the animals. If you are not separating feed cost between feed fed to breeding and weaned animals, either enter the total cost here or in the <b>Breeding</b> section. You may also choose to allocate a portion of the total amount to each section.
<b>Health (Vacc, Med, Veterinary cost - \$ total)</b>	Sum of the veterinary and medication bills for vaccines, antimicrobials, hormones, etc.
<b>Cost of gain - given (\$/lb)</b>	In the beef feedlot sector, producers calculate their cost of gain in \$ per pound. Leave blank if you do not calculate this value.

<b>Milk</b>	
<b>Number of females lactating</b>	Number of lactating animals during the period considered
<b>Average lactation duration (days)</b>	Average lactation duration in days
<b>Average milk production (kg/F/day)</b>	Average number of kg of milk produced per cow/ewe/doe per day
<b>Milk value (\$/kg)</b>	Milk price in \$ per kg of milk
<b>Feed consumed (tonnes total)</b>	Total amount of feed consumed in metric tonnes. May also include any farm-produced feedstuff that was fed to the animals.
<b>Feed cost (\$ total)</b>	Sum of all of the feed bills for the lactating animals. May also include any farm-produced feedstuff that was fed to the animals.
<b>Health (Vacc, Med, Veterinary cost - \$ total)</b>	Sum of the veterinary and medication bills for vaccines, antimicrobials, hormones, etc.

## 2 Calculated Impact of Disease on Production Parameters

This information is found on the “calculations” tab of the spreadsheet.



The impacts of disease on production were identified and documented via an extensive literature review and consultations with a Veterinary Expert Panel. In the model/calculator, we captured the minimum and the maximum impact reported in the literature reviewed. We used this information to estimate the impact of a low severity outbreak and of a high severity outbreak.

Some impacts are qualitative or poorly quantified and are documented as such and they were not factored into the calculations.

Should a value look wrong to you, it may very well be. By using the tool with producers from various production types we have discovered that it is almost always because the data was not entered in the units expected by the model or that animals were missing or added. We recommend that you go back to the data entry tab to make sure that you used:

- Data for one period only, whether the duration of that period is one year, one breeding cycle or one lot of animals it is important to be consistent and to follow the production flow for only those animals that are a part of the chosen period.
- the expected unit of measure (animal weight in pounds, feed in metric tonnes)
- live weight in pounds (not carcass weight)
- price per pound live (not price on rail weight)

### **3 Calculated Impact of Disease on Farm Economics**

Using the producer's own production data against the documented impact of disease range, producers get a calculated value of the potential impact of the selected disease on their operation.

Human risk of zoonosis, impact on market access or trade, impact on product quality, or psychological impact of dealing with an animal outbreak are not factored into these calculations and go beyond the scope of this tool.

#### **3.1 Benefits and How to Use the Tool**

- Use information readily available to most farms
- Quantifies potential additional farm output and revenue that could be achieved if one was able to eliminate the disease on the farm; or
- Quantify potential losses should the disease infect the farm
- This helps quantify the economic risk of disease
- This knowledge can help producers to formulate a business case for additional investment into preventative measures that will prevent the introduction of new diseases on the farm or to justify removing or treating sick animals
- The probability of getting and spreading the disease can be further reduced by implementing:
  - better husbandry methods,
  - stricter biosecurity protocols,
  - adapted preventive medicine protocols.

## 4 Economic Impact – Advanced User, Additional Disease

Save a copy of the model under a different file name to maintain the original data. While on the “calculations” tab, unprotect the sheet. There is no password. To perform this action right-click the “calculations” tab and choose “Unprotect Sheet”. ***Be careful, once you have done this, you may lose some formulas if you inadvertently type information other than in cells from column E or F.***

By unprotecting this sheet you will now be able to enter different values in column E (lower end of the impact on productivity) and/or F (higher end of the impact on productivity). This can be helpful if you are interested in investigating a disease impact that was not documented in the literature. You can also develop your own assumptions for any other disease of your choice.

Enter a value as a percent increase or decrease of the actual data entered. For mortality or culls, the % you enter is added to the value you entered from your farm.