

Use of weight data for broiler chickens and laying hens

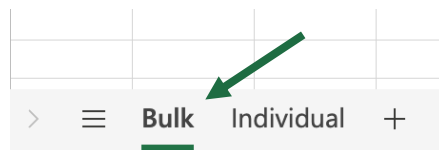
Using the provided sample database, answer the following questions:

Q1: Using the BULK weighing sheet of the database, calculate the average weight for:

- a. birds in Shed A *0.57065kg (or 0.57kg or 0.571kg)*
- b. birds in Shed B *0.57475kg (or 0.57kg or 0.575kg)*

Solution:

First select the “**Bulk**” weighing sheet by clicking the label in the bottom left corner of the screen. It will be underlined in green when active:



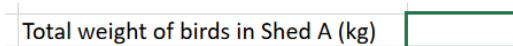
In this sheet we have recorded the “**Bulk Weight (kg)**” of 50 birds in each of four locations in Shed A, and 50 birds in each of four locations in Shed B:

| | A | B | C | D | E | F |
|----|--------|------|----------|------------|-----------------|------------------|
| | Date | Shed | Location | Age (days) | Number of birds | Bulk weight (kg) |
| 1 | 230518 | A | 1 | 14 | 50 | 28.48 |
| 2 | 230518 | A | 2 | 14 | 50 | 28.51 |
| 3 | 230518 | A | 3 | 14 | 50 | 28.73 |
| 4 | 230518 | A | 4 | 14 | 50 | 28.41 |
| 5 | 230518 | B | 1 | 14 | 50 | 28.65 |
| 6 | 230518 | B | 2 | 14 | 50 | 28.84 |
| 7 | 230518 | B | 3 | 14 | 50 | 28.92 |
| 8 | 230518 | B | 4 | 14 | 50 | 28.54 |
| 9 | | | | | | |
| 10 | | | | | | |

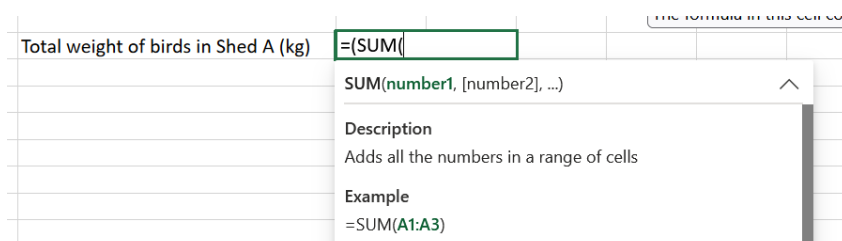
To find the average weight for birds in Shed A, first add the “**Bulk Weight (kg)**” of the 50 birds in the four different locations in the shed, giving the weight for 200 birds in total.

In Excel we do this by entering a formula.

Label an empty cell “**Total weight of birds in Shed A (kg)**”:



Then, type “**=**” into the highlighted cell, followed by “**SUM**”



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Now select the data to be summarised: the four bulk weights from Shed A only. Do not select the entire **“Bulk Weight (kg)”** column, as this includes the weights of the 200 birds in Shed B, which we want to calculate separately.

Click and drag the cursor over the four cells containing the data, highlighting them as below:

| | A | B | C | D | E | F | G | H | I | J |
|---|--------|------|----------|------------|-----------------|------------------|-------|--------------------------------------|-------------|---|
| 1 | Date | Shed | Location | Age (days) | Number of birds | Bulk weight (kg) | | | | |
| 2 | 230518 | A | | 1 | 14 | 50 | 28.48 | | | |
| 3 | 230518 | A | | 2 | 14 | 50 | 28.51 | Total weight of birds in Shed A (kg) | =SUM(F2:F5) | |
| 4 | 230518 | A | | 3 | 14 | 50 | 28.73 | | | |
| 5 | 230518 | A | | 4 | 14 | 50 | 28.41 | | | |
| 6 | 230518 | B | | 1 | 14 | 50 | 28.65 | | | |
| 7 | 230518 | B | | 2 | 14 | 50 | 28.84 | | | |
| 8 | 230518 | B | | 3 | 14 | 50 | 28.92 | | | |
| 9 | 230518 | B | | 4 | 14 | 50 | 28.54 | | | |

The formula also appears in the formula bar in the Excel ribbon. In this case, the selected are in cells F2 to F5. Excel has entered this as **“F2:F5”** in the formula:

=SUM(F2:F5

Now type two closing brackets **“)”** and press **Enter**. Excel will calculate the sum of the selected data:

| | | | |
|--------------------------------------|-------------|--------------------------------------|--------|
| Total weight of birds in Shed A (kg) | =SUM(F2:F5) | Total weight of birds in Shed A (kg) | 114.13 |
|--------------------------------------|-------------|--------------------------------------|--------|

This is the total weight of 200 birds, so divide the **“Total weight of the birds in Shed A”** by 200 to get the average weight per bird.

Label an empty cell as **“Average weight of bird in Shed A (kg)”**

| | |
|---------------------------------------|--------|
| Total weight of birds in Shed A (kg) | 114.13 |
| Average weight of bird in Shed A (kg) | |

Click into the next empty cell and type **“=”**. Then select the cell with the **“Total weight of the birds in Shed A”**:

| | |
|---------------------------------------|--------|
| Total weight of birds in Shed A (kg) | 114.13 |
| Average weight of bird in Shed A (kg) | =I3 |

Then type **“/200”** to divide the result by 200, and press **Enter** to perform the calculation:

| | | | |
|---------------------------------------|---------|---------------------------------------|--------|
| Total weight of birds in Shed A (kg) | 114.13 | Total weight of birds in Shed A (kg) | 114.13 |
| Average weight of bird in Shed A (kg) | =I3/200 | Average weight of bird in Shed A (kg) | 0.57 |

The average weight of birds in Shed A is then displayed as 0.57065kg, which can be rounded to 0.57kg or 0.571kg.

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To find the average weight for the birds in Shed B, repeat the same procedure, but this time select the cells containing the data for the Shed B chickens when calculating the total bird weight as shown below:

| | A | B | C | D | E | F | G | H | I | J |
|---|--------|------|----------|------------|-----------------|------------------|---|---------------------------------------|-------------|---|
| 1 | Date | Shed | Location | Age (days) | Number of birds | Bulk weight (kg) | | | | |
| 2 | 230518 | A | | 14 | 50 | 28.48 | | | | |
| 3 | 230518 | A | | 2 | 14 | 28.51 | | Total weight of birds in Shed A (kg) | 114.13 | |
| 4 | 230518 | A | | 3 | 14 | 28.73 | | Average weight of bird in Shed A (kg) | 0.57 | |
| 5 | 230518 | A | | 4 | 14 | 28.41 | | | | |
| 6 | 230518 | B | | 14 | 50 | 28.65 | | Total weight of birds in Shed B (kg) | =SUM(F6:F9) | |
| 7 | 230518 | B | | 2 | 14 | 28.84 | | | | |
| 8 | 230518 | B | | 3 | 14 | 28.92 | | | | |
| 9 | 230518 | B | | 4 | 14 | 28.54 | | | | |

Then calculate the average bird weight by dividing the total bird weight by the number of birds (200):

| | |
|---------------------------------------|-----------|
| Total weight of birds in Shed B (kg) | 114.95 |
| Average weight of bird in Shed B (kg) | =(I6/200) |

The average weight of birds in Shed A is then displayed as 0.57475kg, which can be rounded to 0.57kg or 0.575kg.

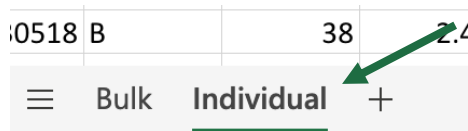
Answer Key

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Q2. Using the INDIVIDUAL weighing sheet of the provided dataset, calculate:

- a. the standard deviation of birds in Shed B **0.145kg**
- b. the average weight of birds in Shed B **2.37kg**
- c. the flock uniformity (coefficient of variance) of birds in Shed B **6.1%**

First select the “**Individual**” weighing sheet by clicking the label in the bottom left corner of the screen. It will be underlined in green when active:



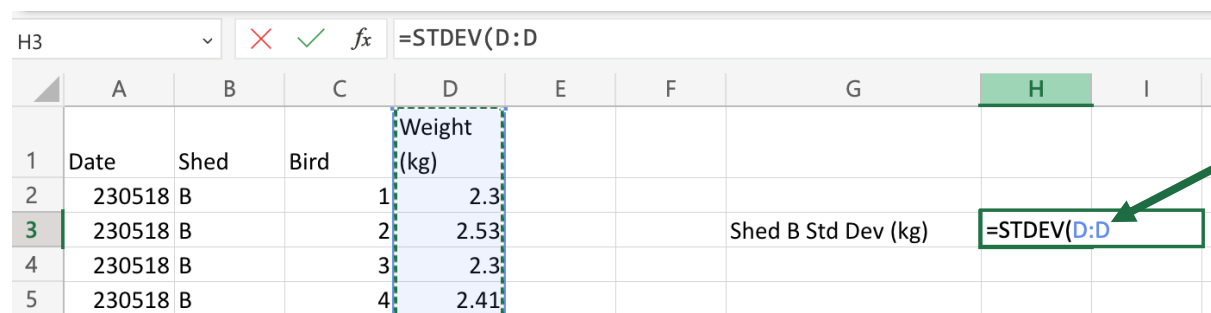
a. Calculate the standard deviation of birds in Shed B

To calculate the standard deviation of birds in Shed B we will use an Excel formula.

First type “**Shed B Std Dev (kg)**” or a similar descriptor into an empty cell:

| | A | B | C | D | E | F | G | H |
|---|--------|------|------|-------------|---|---|---------------------|---|
| | Date | Shed | Bird | Weight (kg) | | | | |
| 2 | 230518 | B | 1 | 2.3 | | | | |
| 3 | 230518 | B | 2 | 2.53 | | | Shed B Std Dev (kg) | |
| 4 | 230518 | B | 3 | 2.3 | | | | |
| 5 | 230518 | B | 4 | 2.41 | | | | |

Type “**=STDEV(**” into the cell you want to record the standard deviation in. Then select the entire “**Weight (kg)**” column by clicking the identifier at the top:



Now type a closing bracket “**)**” and press **ENTER** to return the result:

| | | | |
|---------------------|--------------------|---------------------|-----------------|
| Shed B Std Dev (kg) | =STDEV(D:D) | Shed B Std Dev (kg) | 0.145476 |
|---------------------|--------------------|---------------------|-----------------|

The standard deviation of birds in Shed B is therefore 0.145kg.

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b. Calculate the average weight of birds in Shed B

Type “**Shed B Avg weight (kg)**” into the empty cell under the Standard Deviation label:

| | |
|------------------------|----------|
| Shed B Std Dev (kg) | 0.145476 |
| Shed B Avg weight (kg) | |

Now type “**=AVERAGE(**” into the cell you want to record the average bird weight in. Then select the entire “**Weight (kg)**” column by clicking the identifier at the top:

| | | | | | | | | | |
|----|--------|------|------|-------------|---|---|------------------------|---------------|---|
| H4 | | | | | | | | | |
| | A | B | C | D | E | F | G | H | I |
| 1 | Date | Shed | Bird | Weight (kg) | | | | | |
| 2 | 230518 | B | 1 | 2.3 | | | | | |
| 3 | 230518 | B | 2 | 2.53 | | | Shed B Std Dev (kg) | 0.145476 | |
| 4 | 230518 | B | 3 | 2.3 | | | Shed B Avg weight (kg) | =AVERAGE(D:D) | |
| 5 | 230518 | B | 4 | 2.41 | | | | | |

Now type a closing bracket “**)**” and press **ENTER** to return the result:

| | | | |
|------------------------|---------------|------------------------|----------|
| Shed B Std Dev (kg) | 0.145476 | Shed B Std Dev (kg) | 0.145476 |
| Shed B Avg weight (kg) | =AVERAGE(D:D) | Shed B Avg weight (kg) | 2.3668 |

The average weight of birds in Shed B is therefore 2.3668kg, which can be rounded to 2.37kg.

c. Calculate the flock uniformity (Coefficient of Variance) of birds in Shed B

Type “**Shed B CoVar (%)**” into the empty cell under the average weight label:

| | |
|------------------------|----------|
| Shed B Std Dev (kg) | 0.145476 |
| Shed B Avg weight (kg) | 2.3668 |
| Shed B CoVar (%) | |

The Coefficient of Variance is equal to the Standard Deviation of the birds, divided by the Average Weight of the birds, then multiplied by 100:

$$\text{Coefficient of Variance (\%)} = (\text{Standard Deviation} / \text{Average Weight}) \times 100$$

Answer Key

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So, in the empty cell next to the descriptor, type “=”, then select the cell containing the standard deviation:

| | |
|------------------------|----------|
| Shed B Std Dev (kg) | 0.145476 |
| Shed B Avg weight (kg) | 2.3668 |
| Shed B CoVar (%) | =(H3 |

Then type the divide sign “/” and select the cell containing the average bird weight:

| | |
|------------------------|----------|
| Shed B Std Dev (kg) | 0.145476 |
| Shed B Avg weight (kg) | 2.3668 |
| Shed B CoVar (%) | =(H3/H4 |

Then type a closing bracket “)”. To express the Coefficient of Variance as a percentage, multiply by 100, by typing “*100”:

| | |
|------------------------|--------------|
| Shed B Std Dev (kg) | 0.145476 |
| Shed B Avg weight (kg) | 2.3668 |
| Shed B CoVar (%) | =(H3/H4)*100 |

Then press **ENTER** and to return the result:

| | |
|------------------------|----------|
| Shed B Std Dev (kg) | 0.145476 |
| Shed B Avg weight (kg) | 2.3668 |
| Shed B CoVar (%) | 6.146545 |

The Coefficient of Variance, or flock uniformity, is therefore 6.1%. A very good result!