

Answer Key

Data 102: How to perform simple calculations and data summaries

Using the provided sample database, answer the following questions:

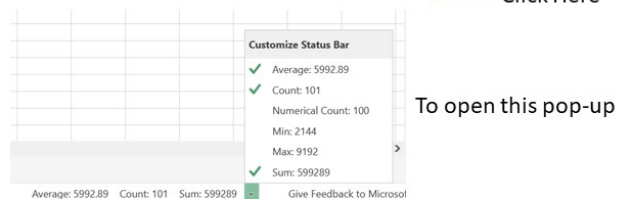
Q1. How many calves are in the record? 100 calves

Solution:

- Select the **Calf ID** column – though any column would also work since each column contains the same numbers of rows.
- Click on the small arrow shown below at the bottom of the screen:

| Cow ID | Calf ID | Date of birth | Calf sex | Birth weight (kg) | Weaning age (days) | Weaning weight (kg) |
|--------|---------|---------------|----------|-------------------|--------------------|---------------------|
| 5862 | 7400 | 230406 | bull | 39.2 | 230 | 300 |
| 3630 | 2318 | 230406 | heifer | 51.7 | 230 | 227 |
| 7856 | 5765 | 230406 | bull | 38.8 | 230 | 291 |
| 5116 | 7634 | 230407 | bull | 40.4 | 229 | 245 |
| 7248 | 4093 | 230407 | bull | 47.9 | 229 | 259 |
| 4570 | 9192 | 230407 | heifer | 38 | 228 | 313 |
| 8703 | 2609 | 230407 | bull | 39.3 | 227 | 289 |
| 7744 | 3675 | 230408 | heifer | 41.7 | 226 | 336 |
| 3333 | 4435 | 230408 | heifer | 42.5 | 226 | 259 |
| 2235 | 5326 | 230410 | bull | 38.4 | 226 | 280 |
| 5053 | 8873 | 230410 | heifer | 42.4 | 226 | 311 |
| 2999 | 4414 | 230410 | bull | 37 | 225 | 208 |
| 6932 | 8704 | 230410 | bull | 44.5 | 225 | 221 |
| 6384 | 2746 | 230411 | bull | 39.3 | 224 | 247 |
| 8686 | 3490 | 230412 | heifer | 45.8 | 224 | 256 |
| 7356 | 6025 | 230413 | bull | 39 | 223 | 330 |
| 8574 | 6090 | 230413 | heifer | 43.9 | 223 | 248 |
| 2638 | 4467 | 230415 | bull | 47 | 222 | 259 |

Click Here



To open this pop-up

- Select **Numerical Count** to count the number of rows containing numerical data in the column, ignoring the column name. This is equal to the number of animals.

Customize Status Bar

- ✓ Average: 5992.89
- ✓ Count: 101
- ✓ Numerical Count: 100
- Min: 2144
- Max: 9192
- ✓ Sum: 599289

Average: 5992.89 Count: 101 Numerical Count: 100 Sum: 599289 Give Feedback to Microsoft


Average: 5992.89 Count: 101 Numerical Count: 100 Min: 2144 Max: 9192 Sum: 599289

Q2: For birth weight, calculate:

- a. Minimum birth weight 37kg**
- b. Maximum birth weight 52kg**
- c. Average birth weight 44.057kg**

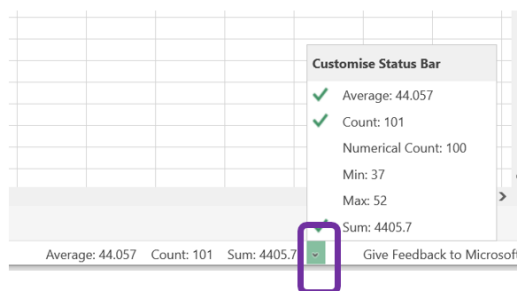
Solution 1: Using Status Bar

- Select the **Birth weight** column using the column identifier **E**

Click Here 

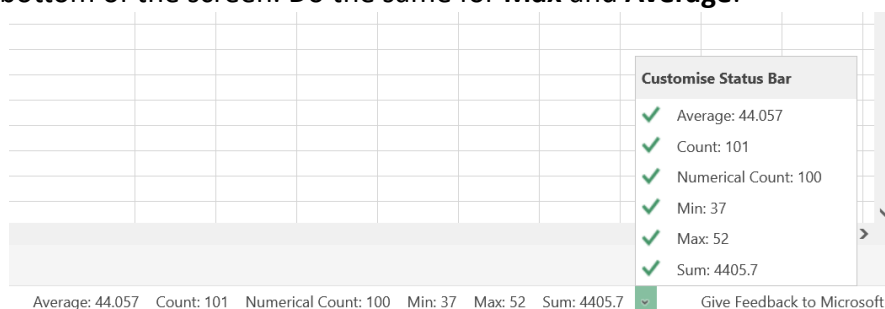
| | A | B | C | D | E | F | G | H |
|----|--------|---------|---------------|----------|-------------------|--------------------|---------------------|---|
| | Cow ID | Calf ID | Date of birth | Calf sex | Birth weight (kg) | Weaning age (days) | Weaning weight (kg) | |
| 1 | | | | | | | | |
| 2 | 5862 | 7400 | 230406 | bull | 39.2 | 230 | 300 | |
| 3 | 3630 | 2318 | 230406 | heifer | 51.7 | 230 | 227 | |
| 4 | 7856 | 5765 | 230406 | bull | 38.8 | 230 | 291 | |
| 5 | 5116 | 7634 | 230407 | bull | 40.4 | 229 | 245 | |
| 6 | 7248 | 4093 | 230407 | bull | 47.9 | 229 | 259 | |
| 7 | 4570 | 9192 | 230407 | heifer | 38 | 228 | 313 | |
| 8 | 8703 | 2609 | 230407 | bull | 39.3 | 227 | 289 | |
| 9 | 7744 | 3675 | 230408 | heifer | 41.7 | 226 | 336 | |
| 10 | 3333 | 4435 | 230408 | heifer | 42.5 | 226 | 259 | |
| 11 | 2235 | 5328 | 230410 | bull | 38.4 | 226 | 280 | |
| 12 | 5053 | 8873 | 230410 | heifer | 42.4 | 226 | 311 | |
| 13 | 2999 | 4414 | 230410 | bull | 37 | 225 | 208 | |
| 14 | 6932 | 8704 | 230410 | bull | 44.5 | 225 | 221 | |
| 15 | 6384 | 7746 | 230411 | bull | 39.3 | 224 | 247 | |

- Click on the small arrow shown below at the bottom of the screen to open the pop up as shown:



Click here 

- Click on **Min** so a green tick appears next to it, and you will see it displayed in the bar at the bottom of the screen. Do the same for **Max** and **Average**:

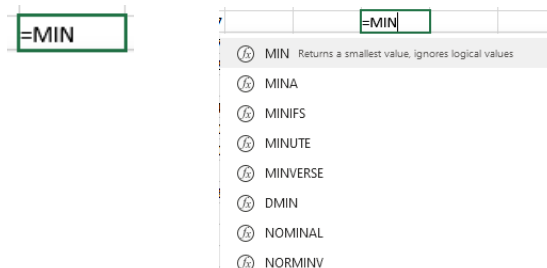


Solution 2: Using Formulae

- This time we will use a formula to find the minimum birth weight so that we can view the value even when the column isn't selected.
- Select an empty cell to store the data:

| | A | B | C | D | E | F | G | H | I | J | K |
|----|--------|---------|---------------|----------|-------------------|--------------------|---------------------|---|---|---|---|
| | Cow ID | Calf ID | Date of birth | Calf sex | Birth weight (kg) | Weaning age (days) | Weaning weight (kg) | | | | |
| 1 | | | | | | | | | | | |
| 2 | 5862 | 7400 | 230406 | bull | 39.2 | 230 | 300 | | | | |
| 3 | 3630 | 2318 | 230406 | heifer | 51.7 | 230 | 227 | | | | |
| 4 | 7856 | 5765 | 230406 | bull | 38.8 | 230 | 291 | | | | |
| 5 | 5116 | 7634 | 230407 | bull | 40.4 | 229 | 245 | | | | |
| 6 | 7248 | 4093 | 230407 | bull | 47.9 | 229 | 259 | | | | |
| 7 | 4570 | 9192 | 230407 | heifer | 38 | 228 | 313 | | | | |
| 8 | 8703 | 2609 | 230407 | bull | 39.3 | 227 | 289 | | | | |
| 9 | 7744 | 3675 | 230408 | heifer | 41.7 | 226 | 336 | | | | |
| 10 | 3333 | 4435 | 230408 | heifer | 42.5 | 226 | 259 | | | | |
| 11 | 2235 | 5328 | 230410 | bull | 38.4 | 226 | 280 | | | | |
| 12 | 5053 | 8873 | 230410 | heifer | 42.4 | 226 | 311 | | | | |
| 13 | 2999 | 4414 | 230410 | bull | 37 | 225 | 208 | | | | |
| 14 | 6932 | 8704 | 230410 | bull | 44.5 | 225 | 221 | | | | |
| 15 | 6384 | 2746 | 230411 | bull | 39.3 | 224 | 247 | | | | |
| 16 | 8686 | 3490 | 230412 | heifer | 45.8 | 224 | 256 | | | | |
| 17 | 7356 | 6025 | 230413 | bull | 39 | 223 | 330 | | | | |
| 18 | 8574 | 6090 | 230413 | heifer | 43.9 | 223 | 248 | | | | |
| 19 | 2638 | 4467 | 230415 | bull | 47 | 222 | 259 | | | | |

- To tell Excel you want to use a formula to find the minimum, type “=MIN” into the empty cell:



- Then type an opening bracket/ parenthesis “(“



- Now select the data you want to find the minimum of – in this case the entire **Birth weight** column, using the column identifier (E):

Answer Key

Data 102: How to perform simple calculations and data summaries

Click Here

| | A | B | C | D | E | F | G | H | I | J |
|----|--------|---------|---------------|----------|-------------------|--------------------|---------------------|---|---|-----------|
| 1 | Cow ID | Calf ID | Date of birth | Calf sex | Birth weight (kg) | Weaning age (days) | Weaning weight (kg) | | | |
| 2 | 5862 | 7400 | 230406 | bull | 39.2 | 230 | 300 | | | |
| 3 | 3630 | 2318 | 230406 | heifer | 51.7 | 230 | 227 | | | |
| 4 | 7856 | 5765 | 230406 | bull | 38.8 | 230 | 291 | | | =MIN(E:E) |
| 5 | 5116 | 7634 | 230407 | bull | 40.4 | 229 | 245 | | | |
| 6 | 7248 | 4093 | 230407 | bull | 47.9 | 229 | 259 | | | |
| 7 | 4570 | 9192 | 230407 | heifer | 38 | 228 | 313 | | | |
| 8 | 8703 | 2609 | 230407 | bull | 39.3 | 227 | 289 | | | |
| 9 | 7744 | 3675 | 230408 | heifer | 41.7 | 226 | 336 | | | |
| 10 | 3333 | 4435 | 230408 | heifer | 42.5 | 226 | 259 | | | |
| 11 | 2235 | 5328 | 230410 | bull | 38.4 | 226 | 280 | | | |
| 12 | 5053 | 8873 | 230410 | heifer | 42.4 | 226 | 311 | | | |
| 13 | 2999 | 4414 | 230410 | bull | 37 | 225 | 208 | | | |
| 14 | 6932 | 8704 | 230410 | bull | 44.5 | 225 | 221 | | | |
| 15 | 6384 | 2746 | 230411 | bull | 39.3 | 224 | 247 | | | |

- Add a closing bracket “)” - Your formula should now look like this:

=MIN(E:E)

- Press enter and Excel will calculate and display the **Minimum birth weight** in your chosen cell.

- It is good practice to record what the contents of the cell are by writing yourself a note in an adjacent cell as shown:

| | |
|---------------------------|----|
| Minimum Birth Weight (kg) | 37 |
|---------------------------|----|

- To calculate the maximum value, repeat the procedure but instead of typing “MIN” use “MAX”:

=MAX(E:E)

- To calculate the average value, repeat the procedure but instead of typing “MIN” use “AVERAGE”:

=(AVERAGE(E:E))

- Now your spreadsheet will look like this:

| | A | B | C | D | E | F | G | H | I | J | K |
|----|--------|---------|---------------|----------|-------------------|--------------------|---------------------|---|---------------------------|--------|---|
| 1 | Cow ID | Calf ID | Date of birth | Calf sex | Birth weight (kg) | Weaning age (days) | Weaning weight (kg) | | | | |
| 2 | 5862 | 7400 | 230406 | bull | 39.2 | 230 | 300 | | | | |
| 3 | 3630 | 2318 | 230406 | heifer | 51.7 | 230 | 227 | | Average Birth Weight (kg) | 44.057 | |
| 4 | 7856 | 5765 | 230406 | bull | 38.8 | 230 | 291 | | Minimum Birth Weight (kg) | 37 | |
| 5 | 5116 | 7634 | 230407 | bull | 40.4 | 229 | 245 | | Maximum Birth Weight (kg) | 52 | |
| 6 | 7248 | 4093 | 230407 | bull | 47.9 | 229 | 259 | | | | |
| 7 | 4570 | 9192 | 230407 | heifer | 38 | 228 | 313 | | | | |
| 8 | 8703 | 2609 | 230407 | bull | 39.3 | 227 | 289 | | | | |
| 9 | 7744 | 3675 | 230408 | heifer | 41.7 | 226 | 336 | | | | |
| 10 | 3333 | 4435 | 230408 | heifer | 42.5 | 226 | 259 | | | | |
| 11 | 2235 | 5328 | 230410 | bull | 38.4 | 226 | 280 | | | | |
| 12 | 5053 | 8873 | 230410 | heifer | 42.4 | 226 | 311 | | | | |
| 13 | 2999 | 4414 | 230410 | bull | 37 | 225 | 208 | | | | |
| 14 | 6932 | 8704 | 230410 | bull | 44.5 | 225 | 221 | | | | |
| 15 | 6384 | 2746 | 230411 | bull | 39.3 | 224 | 247 | | | | |

Q3: For weaning weight, calculate:

- a. Minimum weaning weight **200kg**
- b. Maximum weaning weight **340kg**
- c. Average weaning weight **271.94kg**

Solution 1: Using Status Bar

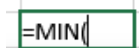
- This is exactly the same procedure as we previously used to find the minimum, maximum and average birth weight, but we select the data in the **Weaning weight** column **G** instead.

Solution 2: Using Formula

- We will again use a formula to find the minimum weaning weight. The procedure is the same as the one we used to calculate the minimum birth weight but uses the weaning weight data instead of the birth weight.

- Select an empty cell to store the minimum value in.

- To tell Excel you wish to enter a formula to find the minimum value of some data type “=MIN(” into the empty cell:



- Now select the data you wish to find the minimum of – in this case the entire **Weaning weight** column, using the column identifier **G**:

| | G | H | I | J | K | L |
|-----|---------------------|------------------|---|-----------------------------|----------|---|
| ing | Weaning weight (kg) | Weight gain (kg) | | | | |
| 230 | 300 | 260.8 | | | | |
| 230 | 227 | 175.3 | | Average Birth Weight (kg) | 44.057 | |
| 230 | 291 | 252.2 | | Minimum Birth Weight (kg) | 37 | |
| 229 | 245 | 204.6 | | Maximum Birth Weight (kg) | 52 | |
| 229 | 259 | 211.1 | | | | |
| 228 | 313 | 275 | | | | |
| 227 | 289 | 249.7 | | Minimum Weaning Weight (kg) | =MIN(G:G | |
| 226 | 336 | 294.3 | | | | |

- Add a closing bracket “)” and Excel will calculate and display the **Minimum birth weight** in your chosen cell.
- To calculate the maximum value, repeat the procedure but instead of typing “MIN(” use “MAX(”.
- To calculate the average value, repeat the procedure but instead of typing “MIN(” use “AVERAGE(”.

Q4: Calculate the weight gain for each calf over the pre-weaning period, and then find the average weight gain for all calves. 227.883kg

Solution:

- To calculate the weight gain for each calf over the pre-weaning period, we need to subtract the **Birth weight** of each calf from its **Weaning weight**.
- First, label an empty column with the new variable name: **“Weight gain (kg)”**:

| | A | B | C | D | E | F | G | H | I | J |
|---|--------|---------|---------------|----------|-------------------|--------------------|---------------------|------------------|---------------------------|--------|
| | Cow ID | Calf ID | Date of birth | Calf sex | Birth weight (kg) | Weaning age (days) | Weaning weight (kg) | Weight gain (kg) | | |
| 2 | 5862 | 7400 | 230406 | bull | 39.2 | 230 | 300 | | | |
| 3 | 3630 | 2318 | 230406 | heifer | 51.7 | 230 | 227 | | Average Birth Weight (kg) | 44.057 |
| 4 | 7856 | 5765 | 230406 | bull | 38.8 | 230 | 291 | | Minimum Birth Weight (kg) | 37 |
| 5 | 5116 | 7634 | 230407 | bull | 40.4 | 229 | 245 | | Maximum Birth Weight (kg) | 52 |
| 6 | 7248 | 4093 | 230407 | bull | 47.9 | 229 | 259 | | | |
| 7 | 4570 | 9192 | 230407 | heifer | 38 | 228 | 313 | | | |
| 8 | 8703 | 2609 | 230407 | bull | 39.3 | 227 | 289 | | | |
| 9 | 7744 | 3675 | 230408 | heifer | 41.7 | 226 | 336 | | | |

- To tell Excel you are performing a calculation, type **“=”** in the first cell of the new column followed by a **“(“**:

| | E | F | G | H | I | J |
|--|-------------------|--------------------|---------------------|------------------|---------------------------|--------|
| | Birth weight (kg) | Weaning age (days) | Weaning weight (kg) | Weight gain (kg) | | |
| | 39.2 | 230 | 300 | =(| | |
| | 51.7 | 230 | 227 | | Average Birth Weight (kg) | 44.057 |
| | 38.8 | 230 | 291 | | Minimum Birth Weight (kg) | 37 |
| | 40.4 | 229 | 245 | | Maximum Birth Weight (kg) | 52 |
| | 47.9 | 229 | 259 | | | |

- Now you will tell Excel to subtract the contents of one cell from another. Select the **Weaning weight** cell for the calf – it will be highlighted as shown below:

| | A | B | C | D | E | F | G | H |
|---|--------|---------|---------------|----------|-------------------|--------------------|---------------------|------------------|
| | Cow ID | Calf ID | Date of birth | Calf sex | Birth weight (kg) | Weaning age (days) | Weaning weight (kg) | Weight gain (kg) |
| 2 | 5862 | 7400 | 230406 | bull | 39.2 | 230 | 300 | =(G2 |
| 3 | 3630 | 2318 | 230406 | heifer | 51.7 | 230 | 227 | |

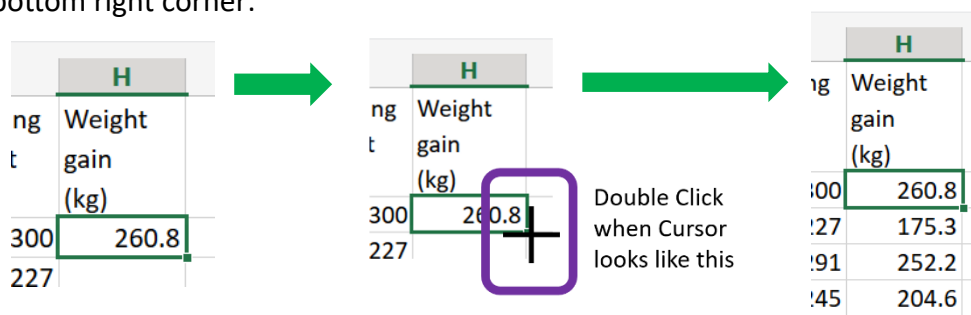
- Then type a minus sign “-” and select the calf’s **Birth weight** cell, which will also become highlighted as shown below:

| | A | B | C | D | E | F | G | H |
|---|--------|---------|---------------|----------|-------------------|--------------------|---------------------|------------------|
| | | | Date of birth | Calf sex | Birth weight (kg) | Weaning age (days) | Weaning weight (kg) | Weight gain (kg) |
| 1 | Cow ID | Calf ID | | | | | | |
| 2 | 5862 | 7400 | 230406 | bull | 39.2 | 230 | 300 | =(G2-E2) |
| 3 | 3630 | 2318 | 230406 | heifer | 51.7 | 230 | 227 | |
| 4 | 7856 | 5765 | 230406 | bull | 38.8 | 230 | 291 | |

- Now type a closing bracket “)”. The contents of the cell should look like the screenshot below, with the **Weaning weight** box highlighted in blue, corresponding to the blue highlighted entry in the calculation, and the **Birth weight** box highlighted in red, corresponding to the red highlighted entry in the calculation:

| | A | B | C | D | E | F | G | H | I |
|---|--------|---------|---------------|----------|-------------------|--------------------|---------------------|------------------|---|
| | | | Date of birth | Calf sex | Birth weight (kg) | Weaning age (days) | Weaning weight (kg) | Weight gain (kg) | |
| 1 | Cow ID | Calf ID | | | | | | | |
| 2 | 5862 | 7400 | 230406 | bull | 39.2 | 230 | 300 | =(G2-E2) | |
| 3 | 3630 | 2318 | 230406 | heifer | 51.7 | 230 | 227 | | |
| 4 | 7856 | 5765 | 230406 | bull | 38.8 | 230 | 291 | | |
| 5 | 5116 | 7634 | 230407 | bull | 40.4 | 229 | 245 | | |

- Press **Enter** and Excel will perform the calculation and display the result.
- To calculate the weight gain for the other calves simply select the cell containing the formula you just wrote, and double click on the little green square that appears in the bottom right corner:



The column will display the weight gain for each calf in the corresponding row.

Answer Key

Data 102: How to perform simple calculations and data summaries

- To find the average weight gain for all calves, we use the same procedure as we did to calculate the average weaning weight and birth weight, but this time with the data in the weight gain column as shown below:

| G | H | I | J | K |
|-------|-----------|-----------------------------|---------------|---|
| aning | Weight | | | |
| ght | Gain (kg) | | | |
| 300 | 260.8 | | | |
| 227 | 175.3 | Average Birth Weight (kg) | 44.057 | |
| 291 | 252.2 | Minimum Birth Weight (kg) | 37 | |
| 245 | 204.6 | Maximum Birth Weight (kg) | 52 | |
| 259 | 211.1 | | | |
| 313 | 275 | Average Weaning Weight (kg) | 271.94 | |
| 289 | 249.7 | Minimum Weaning Weight (kg) | 200 | |
| 336 | 294.3 | Maximum Weaning Weight (kg) | 340 | |
| 259 | 216.5 | | | |
| 280 | 241.6 | Average Weight Gain (kg) | =AVERAGE(H:H) | |
| 311 | 268.6 | | | |

- Press **Enter** to run the formula, and the average weight gain will be shown as 227.883kg

Your final spreadsheet will look like this:

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|----|--------|---------|---------------|----------|-------------------|--------------------|---------------------|------------------|-----------------------------|---------|---|---|---|
| 1 | Cow ID | Calf ID | Date of birth | Calf sex | Birth weight (kg) | Weaning age (days) | Weaning weight (kg) | Weight Gain (kg) | | | | | |
| 2 | 5862 | 7400 | 230406 | bull | 39.2 | 230 | 300 | 260.8 | | | | | |
| 3 | 3630 | 2318 | 230406 | heifer | 51.7 | 230 | 227 | 175.3 | Average Birth Weight (kg) | 44.057 | | | |
| 4 | 7856 | 5765 | 230406 | bull | 38.8 | 230 | 291 | 252.2 | Minimum Birth Weight (kg) | 37 | | | |
| 5 | 5116 | 7634 | 230407 | bull | 40.4 | 229 | 245 | 204.6 | Maximum Birth Weight (kg) | 52 | | | |
| 6 | 7248 | 4093 | 230407 | bull | 47.9 | 229 | 259 | 211.1 | | | | | |
| 7 | 4570 | 9192 | 230407 | heifer | 38 | 228 | 313 | 275 | Average Weaning Weight (kg) | 271.94 | | | |
| 8 | 8703 | 2609 | 230407 | bull | 39.3 | 227 | 289 | 249.7 | Minimum Weaning Weight (kg) | 200 | | | |
| 9 | 7744 | 3675 | 230408 | heifer | 41.7 | 226 | 336 | 294.3 | Maximum Weaning Weight (kg) | 340 | | | |
| 10 | 3333 | 4435 | 230408 | heifer | 42.5 | 226 | 259 | 216.5 | | | | | |
| 11 | 2235 | 5328 | 230410 | bull | 38.4 | 226 | 280 | 241.6 | Average Weight Gain (kg) | 227.883 | | | |
| 12 | 5053 | 8873 | 230410 | heifer | 42.4 | 226 | 311 | 268.6 | | | | | |
| 13 | 2999 | 4414 | 230410 | bull | 37 | 225 | 208 | 171 | | | | | |
| 14 | 6932 | 8704 | 230410 | bull | 44.5 | 225 | 221 | 176.5 | | | | | |
| 15 | 6384 | 2746 | 230411 | bull | 39.3 | 224 | 247 | 207.7 | | | | | |