Showing Totals in Access Queries

New Access users, especially those who are used to keeping their data on an Excel spreadsheet, often ask how they can summarize their records. In Excel you might enter a formula at the foot of a column to sum its values, or maybe use SUMIF or DSUM to examine the data more closely. But an Access table, whilst it may look like a spreadsheet, is just for storing data. When it comes to analyzing your data you need to work with queries.

When Do You Need Query Totals?

An often-overlooked feature of the *Select Query* is its ability to calculate totals. Consider the data shown in this example (*Fig. 1*). The table holds a large number of records, each containing details of a shipment of grain. Each record includes a date (the data was entered in date order so it is already sorted by this column) a country of origin, the name of the commodity and how many tonnes comprised the shipment.

tblCargoes : Table

CargoID	ShippingDate	Origin	Commodity	Tonnes
1	31/01/2000	USA	Oats	24752
2	12/02/2000	USA	Corn	15747
3	05/03/2000	Mexico	Corn	21267
4	20/03/2000	Canada	Corn	20721
5	01/04/2000	Mexico	Soybeans	19878
6	01/04/2000	Argentina	Wheat	16319

Fig. 1 Data suitable for totalling.

If you wanted, you could do a sophisticated analysis of this data with a Crosstab Query or a Pivot Table, but to begin with all you want to know is *"What is the total tonnage for each commodity?"* All the data you need is contained in just two fields, *Commodity* and *Tonnes*, and a Crosstab Query needs at least three fields to work with. You can use the Totals tool instead.

Adding Totals to a Query

The first step is to create a query selecting the fields you are interested in. In this case you would choose to see the *Commodity* and *Tonnes* fields. Running the query at this stage simply displays a list of data (*Fig. 2*).

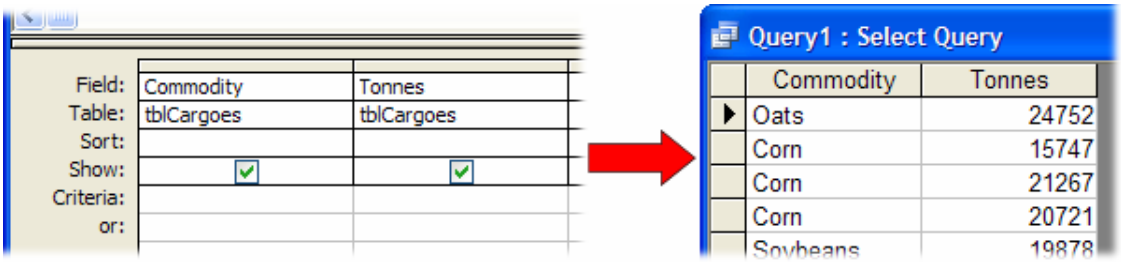

Fig. 2 A simple Select query returns only a list of data.

In the design view of the query activate the *Totals* option by clicking the **Totals** toolbar button (*Fig. 3*), by choosing **View > Totals** or by right-clicking anywhere in the query grid and choosing **Totals** from the shortcut menu.

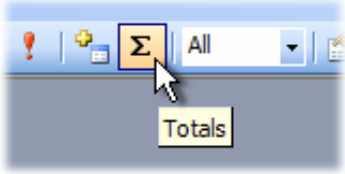

Fig. 3 The Totals tool.

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Activating the Totals option creates another row labelled *Total* in the query grid (*Fig. 4*). The default setting for the Total option for each field is *Group By*, but to create a total you need to change one of these by selecting a type of calculation.

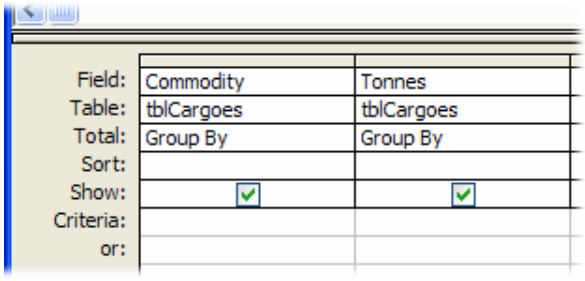


Fig. 4 The Total row is displayed.

In this example you need to ascertain the sum of the *Tonnes* field. Click in the **Total** cell of the column to be calculated (here the *Tonnes* column) then click the down-arrow to reveal a list of choices (*Fig. 5*). Make a choice from the list (here **Sum** is chosen) then run the query.

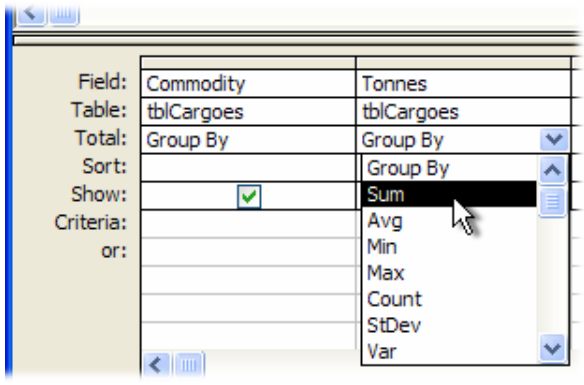
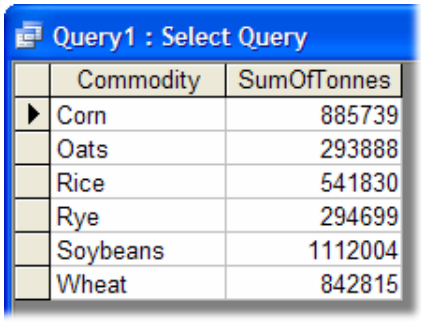


Fig. 5 Calculations offered by the Totals tool.

The result of the query shows a total tonnage for each commodity (*Fig. 6*). The *Commodity* field is automatically sorted into alphabetical order so there's no need to choose a sort option in query design. If you wish you can override the A-Z sort order and choose *Descending* for the grouped field if you want the results sorted the opposite way.



Commodity	SumOfTonnes
Corn	885739
Oats	293888
Rice	541830
Rye	294699
Soybeans	1112004
Wheat	842815

Fig. 6 The total is shown when the query is run.

Formatting the Result

The calculation will inherit the format of its source data. If you want to change that, right-click in the calculated column in the design view of the query and choose **Properties** to display the *Field Properties* dialog. Here you can choose a suitable format from the list or enter your own.

You can also use the *Caption* property to change the heading displayed at the top of the column from the one Access supplies (e.g. *SumOfTonnes*) to something more suitable (*Fig. 7*).

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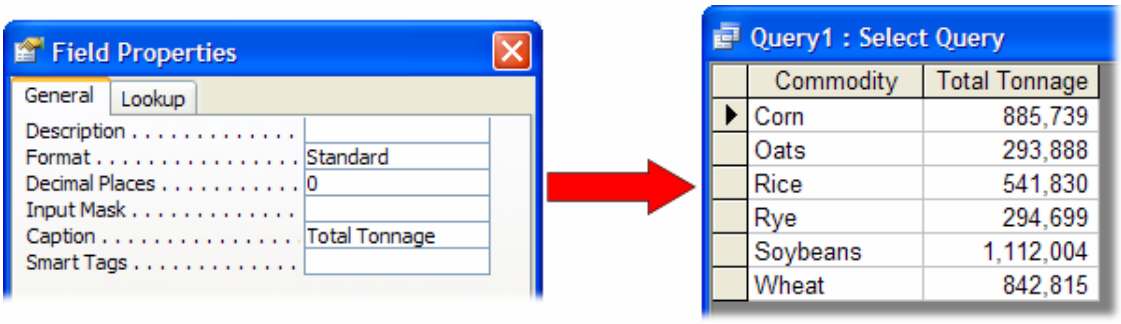

Fig. 7 Use the Field Properties to format the result.

Refining the Query

Since the Totals tool is simply an addition to the Select Query you can still add criteria to the query definition if you wish. Here, criteria have been added to the *Commodity* field to select records for specific commodities (*Fig. 8*).

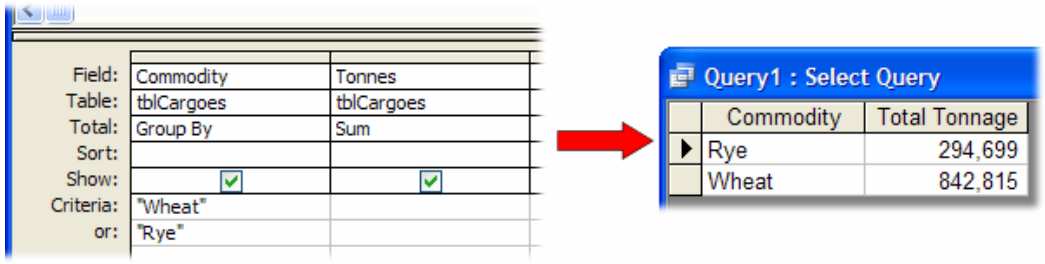

Fig. 8 Adding criteria to filter the results.

You may want to filter by a certain field but not group by that field. To do this, add the field to the grid and set the value in the *Total* row to **Where**. You can now add your criteria to this column (*Fig. 9*).

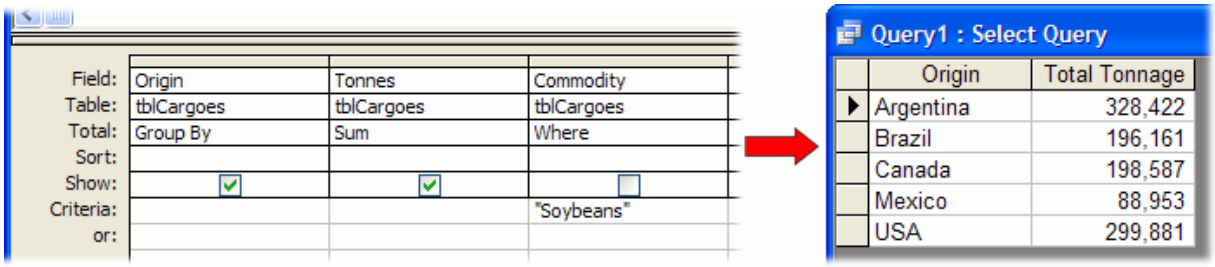

Fig. 9 Adding criteria without grouping by using Where.

When you use the *Where* option the *Show* checkbox for that column is automatically unchecked so that it does not appear in the query result.

Grouping by Several Fields

You can group my as many fields as you wish, providing the chosen fields contain suitable data.

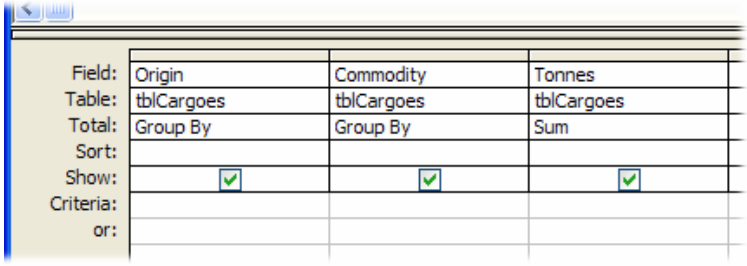

Fig. 10 Grouping by an additional field.

Here, the data has been grouped by both *Origin* and *Commodity* (*Fig. 10*). Again the data is sorted automatically (*Fig. 11*).

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Query1 : Select Query

Origin	Commodity	Total Tonnage
Argentina	Corn	272,145
Argentina	Oats	63,552
Argentina	Rice	128,809
Argentina	Rye	80,447
Argentina	Soybeans	328,422
Argentina	Wheat	209,677
Brazil	Corn	168,679
Brazil	Oats	36,271
Brazil	Rice	128,979
Brazil	Rye	39,597
Brazil	Soybeans	196,161
Brazil	Wheat	152,493
Canada	Corn	146,778
Canada	Oats	63,863
Canada	Rice	96,935

Fig. 11 The resulting query grouped by two fields.

Query1 : Select Query

Commodity	Origin	Total Tonnage
Corn	Argentina	272,145
Corn	Brazil	168,679
Corn	Canada	146,778
Corn	Mexico	66,761
Corn	USA	231,376
Oats	Argentina	63,552
Oats	Brazil	36,271
Oats	Canada	63,863
Oats	Mexico	42,446
Oats	USA	87,756
Rice	Argentina	128,809
Rice	Brazil	128,979
Rice	Canada	96,935
Rice	Mexico	38,964
Rice	USA	148,143

Fig. 12 You can change grouping order.

When grouping by more than one field you can dictate the order in which the data is grouped by arranging the columns appropriately in design view (*Fig. 12*).

Grouping can also be applied to calculated fields. For example, when dates are included in the data you might want to group the results by month or year. Here the data is grouped by year by creating a new calculated field which uses the *Year()* function to generate the year from the *ShippingDate* field (*Fig. 13*).

Field:	Origin	Commodity	Year: Year([ShippingDate])	Tonnes
Table:	tblCargoes	tblCargoes		tblCargoes
Total:	Group By	Group By	Group By	Sum
Sort:				
Show:	☑	☑	☑	☑
Criteria:				
or:				

Fig. 13 A calculated field creates a new Year field.

The data can now be grouped additionally by the new calculated field (*Fig. 14*).

Query1 : Select Query

Origin	Commodity	Year	Total Tonnage
Argentina	Corn	2001	88,069
Argentina	Corn	2002	63,528
Argentina	Corn	2003	15,358
Argentina	Corn	2004	17,673
Argentina	Corn	2005	40,654
Argentina	Corn	2006	46,863
Argentina	Oats	2001	23,331
Argentina	Oats	2002	40,221
Argentina	Rice	2001	17,174
Argentina	Rice	2002	20,917
Argentina	Rice	2003	37,748
Argentina	Rice	2005	37,319

Fig. 14 A calculated field (Year) is included in the grouping.

NOTE: If you create a calculated field that contains one or more *aggregate* functions (e.g. Sum, Count, Avg, Var etc.) the Total row for that field must be set to *Expression*.

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