

Eidgenössisches Volkswirtschaftsdepartement EVD Forschungsanstalt Agroscope Liebefeld-Posieux ALP-Haras





# **User manual**

# **Swiss Feed Database**

**Version August 2013** 











# Content

1.	S	System requirements				
2.	Milestones and data sources					
3.	. Access rights					
4.	Q	uery c	oncept	4		
	4.1	Hor	me page	4		
	4.2	Info	, feedback, login, password	5		
	4.3	Sur	nmary Data (open access)	6		
	4.4	Det	ail Data – roughage (hay) survey (open access)	8		
	4.5	Det	ail Data – raw materials (password protected)	11		
5.	D	ata vie	ws of query reports	13		
	5.1	Dat	a view of Summary Data	13		
	5.2	Dat	a view of Detail Data (open access restricted to hay survey)	14		
	5.	2.1	Interactive layout	14		
	5.	2.2	Nutrient statistics and region comparison	15		
	5.	2.3	Visualization options Google Map	17		
	5.	2.4	View of Detail Data (raw materials, password protected)	18		
6.	С	reate ι	user defined top queries (password protected)	19		
7.	D	Downloads (password protected)				
8.	Contact					

# 1. System requirements

For best performance, use the latest browser versions of Chrome, Firefox, Internet Explorer or Safari. The web- Browser should support DHTML and JavaScript.

In the case of using Internet Explorer version 8 or older, users are asked to install *Google chrome Frame* plug-in. Without this plug-in, many functions do not run properly.

#### 2. Milestones and data sources

# 2007 Online database for summary data (in collaboration with the Swiss Institute of Technology Zurich, Prof. H. Hinterberger):

In 2007, the Swiss online feed database has replaced the print version of the feed recommendations and feed tables for ruminants and pigs. The uploaded summary data represent curated average nutritive values on a dry matter basis which are balanced for data coherence and representativeness. Nutrient and nutritive values of over 600 raw materials and forage for ruminants, pigs, horses and poultry can be retrieved.

available in German and French

# 2013 Extension of the feed database into a temporal Data Warehouse (in collaboration with the University of Zurich, Database Technology Group, Prof. M. Böhlen):

The layout of the web interface of the extended version has been completely redesigned. In addition to summary data, also detail data (individual feed samples) become accessible which are geo-referenced and time-referenced when available. Query reports are enriched with visual tools such as charts and maps.

available in German, French and English

Data upload is still ongoing and it will take some time before completion.

Data stem from three sources:

- Research
- Farms, feed industry, surveys
- Publications, feed databases

The merged print version of the feed tables for ruminants and pigs, which summarize the research activities of Swiss research institutions such as Agroscope and universities, constitute the backbone of the feed database. Ongoing research projects including feeding trials and plant breeding trials will continuously provide data.

Through partnerships with AGRIDEA (agricultural extension service), feed laboratories and the feed industry which regularly contribute to the data pool, we were able to extend the data basis. In this context, the yearly hay survey conducted by AGRIDEA is a valuable source for geo-referenced hay data since 2005. This data set reflects the hay quality produced under Swiss farming conditions. The inclusion of silage data is foreseen in the near future.

Digestibility coefficients, for which no Swiss sources exist, are taken from publications and feed tables of foreign institutions such as INRA, DLG, CVB, ARC and NRC.

# 3. Access rights

The access to the database and data use is defined in the *terms of use* which are binding to all users. The terms of use are stored under *Disclaimer*.

The database is subdivided into an open access and password protected, paying section. The corresponding functionalities are summarized in the following table. The purchase of a password for full access rights costs CHF 150.- per year. Collaborators of Agroscope and the Federal Office for Agriculture, the e-feed group, sponsors and partners are excluded from paying the fee.

Access functions	Open access	Password protected		
		free of charge collaborators of Agroscope, Federal Office for Agriculture, e- feed group, sponsors, partners	paying	
Query summary data	V		V	
e-feed feed catalogue		$\sqrt{}$	$\checkmark$	
Help/Glossary	$\sqrt{}$	$\sqrt{}$	$\sqrt{}$	
Query hay survey		$\sqrt{}$	$\sqrt{}$	
Query detail data	X	$\sqrt{}$	$\checkmark$	
Downloads, data export (with copyright)				
Summary data	X	$\sqrt{}$	<b>V</b>	
Detail data	X	(√)	(√)	
Feeding recommendations	X	$\sqrt{}$	√	
Applications	X	$\sqrt{}$	$\sqrt{}$	
Create user defined top queries	X	V	V	

(√) on request

Open access are all queries relating to summary data of all raw materials and forage including detail data of the hay survey. All supplementary functionalities are password protected to which access is granted on a subscription-based procedure. Subscribers have to login to activate the extended functionalities:

- All queries of detail data
- Data export of summary data as Excel-file. Export of detail data is only available on request.
- Free access to the online version of the feeding recommendations for ruminants and pigs.
- Download of several applications and calculation programs (excel-files).
- Create user defined top queries (query profiles) and save for later use.

# 4. Query concept

Due to the hosting of some parts of the database on two different servers (Agroscope, university of Zurich), it cannot be avoided that the password login has to be repeated more than once.

The database can be accessed by two websites, either over the website of Agroscope <a href="http://www.agroscope.admin.ch/futtermitteldatenbank/index.html">http://www.agroscope.admin.ch/futtermitteldatenbank/index.html</a>, where the files of the feeding recommendations and applications are stored, or directly over <a href="https://www.feeedbase.ch">www.feeedbase.ch</a>. The two websites are interlinked.

# 4.1 Home page

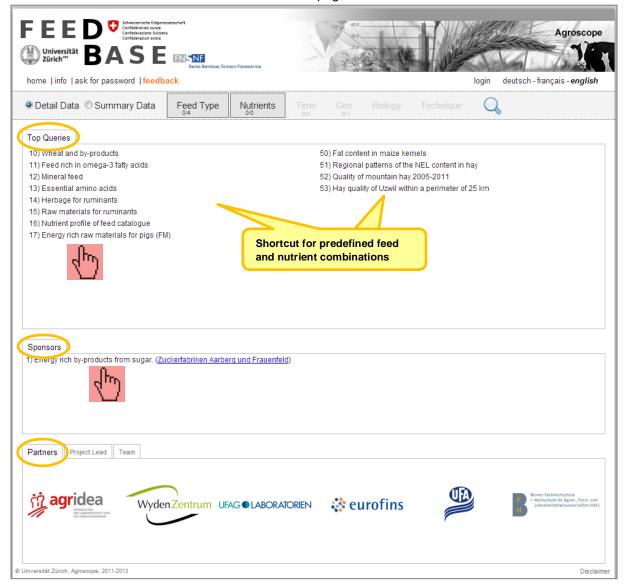
The task bar with search options at the top of the home page is organized into a row of buttons each corresponding to a search category. Additional buttons are for option settings (info, login, language). Some buttons are loaded dynamically depending on already chosen options.

In the middle of the home page, a window section is reserved for *Top queries*. A click on these predefined feed and nutrient combinations loads the shortcut for the corresponding query. The available examples showcase the search functionalities of the database.

In the window section *Sponsors*, predefined, product specific top queries are stored that relate to the product range of sponsors.

Institutions that regularly provide data or collaborate in some form figure under the tab *Partners*.

# Home page

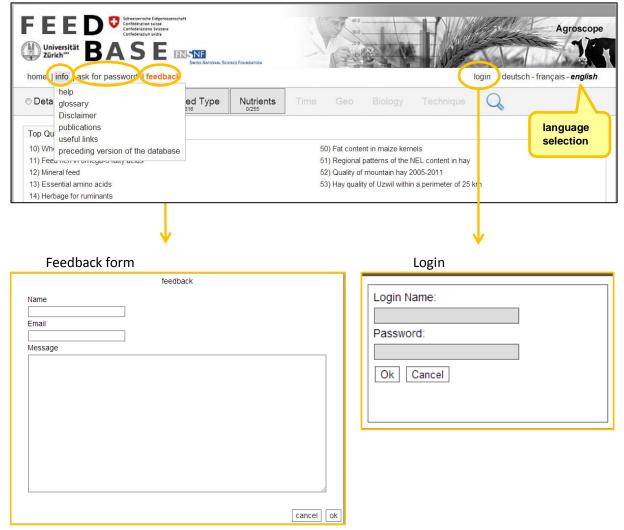


# 4.2 Info, feedback, login, password

The button *info* expands into the following list containing documents or redirecting to other websites: *help* (user manual), *glossary* with the complete feed list and nutrient list in alphabetic order, *Disclaimer* (terms of use), *publications* (redirecting to University of Zurich) and a collection of *useful links*. The link to the preceding version of the database is available only during the transition period. Users can send comments, wishes, suggestions, and questions or notify function disorders using the *feedback form*.

Users must *login* to get access to the password protected section. The password subscription procedure is activated by clicking on the link *ask for password*.

Info, feedback, login, password

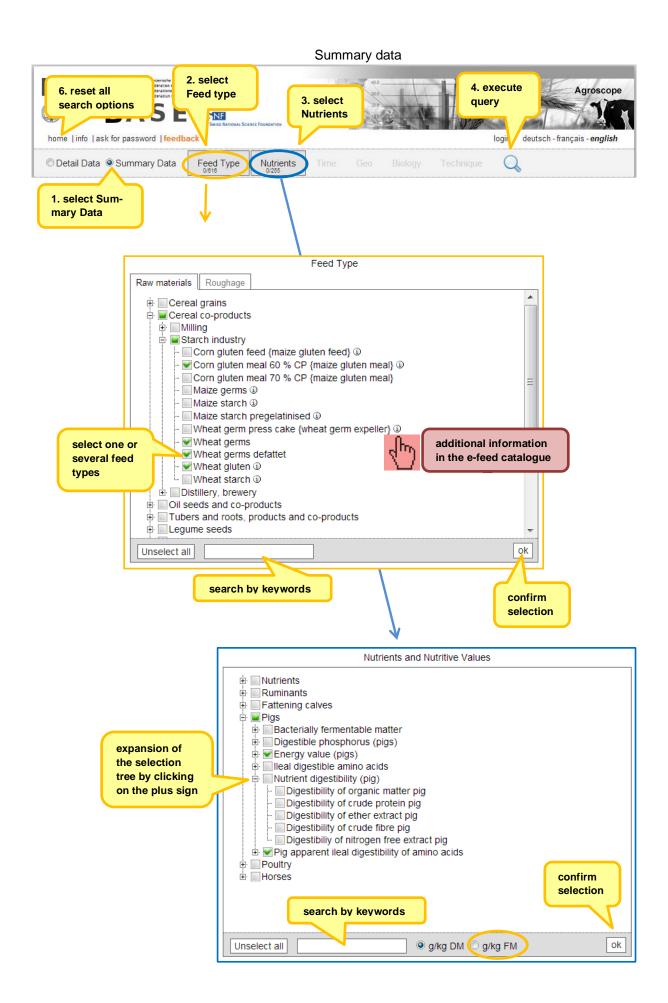


# 4.3 Summary Data (open access)

The queries are constructed along the row of buttons of the task bar from left to right. Each button represents a search category starting with *feed type*. A click on a button expands an overlay window where the relevant search options are structured either as tab, list, and tree of check-boxes or map. Some search options are loaded dynamically based on already chosen options.

#### Query procedure step by step.

- 1. Select Summary Data
- 2. Select feed type (Raw materials and/or Roughage)
- 3. Select Nutrients and/or Nutritive values
- 4. Execute query
- 5. With password: possibility to save the constructed query as a personalized top query and in addition, access to the export function.
- 6. Reset all search options



Is a feed type accompanied by the sign, then the link redirects to the **e-feed-catalogue** (online e-learning tool in feed science) containing a short feed description and indications for feeding restrictions. However, the e-feed-catalogue is not available in English yet.

Selection options must always be confirmed by clicking on the **ok** button.

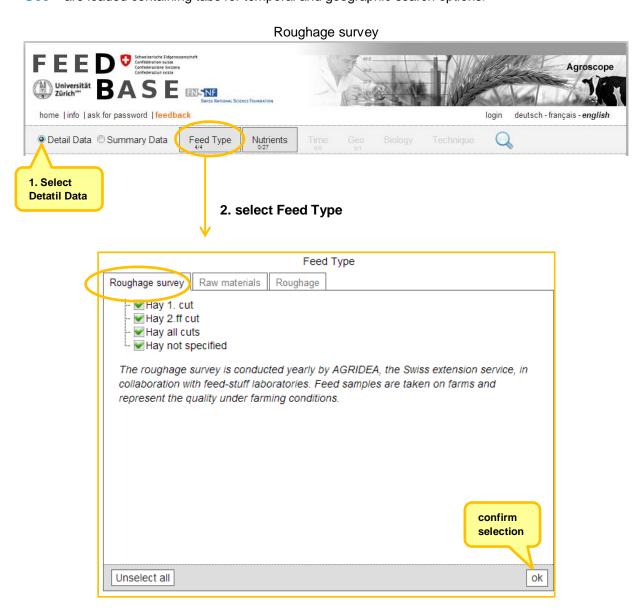
By default, nutrients are displayed in g, mg or MJ per kg of dry matter (DM). If the as-fed basis is preferred, then the option g/kg FM has to be selected.

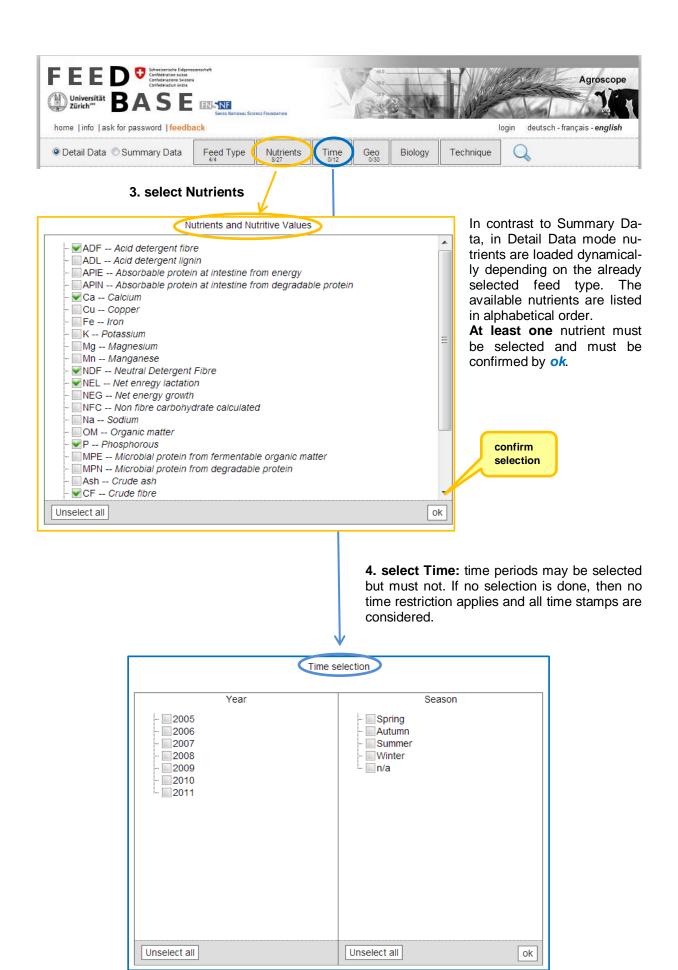
The query is started with the loupe sign By clicking on the *home* button, all search options are reset.

# 4.4 Detail Data – roughage (hay) survey (open access)

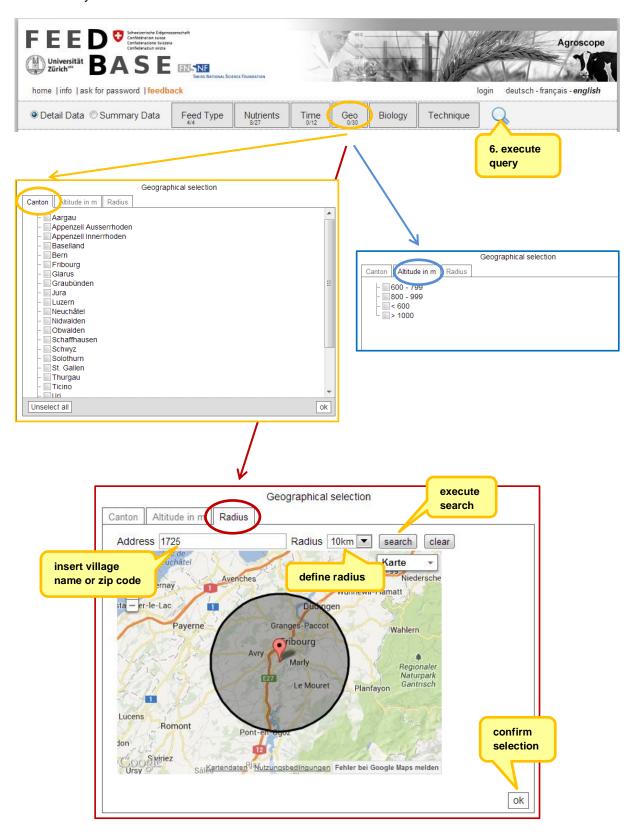
The *Roughage survey* is conducted yearly by AGRIDEA, the Swiss extension service, in collaboration with several feed-stuff laboratories. Feed samples are taken on farms and thus reflect the roughage quality under farming conditions. In most cases, proximate analysis is based on *Near Infrared Spectroscopy* as routine analysis.

The query schema is identical to Summary Data queries except that additional buttons – *Time* and *Geo* – are loaded containing tabs for temporal and geographic search options.





**5. Geographical selection**: *Canton* and *Altitude* may be selected but must not. If no selection is done, then no Geo restriction applies. The tab *Radius* refers to a tool enabling refined geographic search on a user defined, local level. To activate the radius search, a village name or zip code must be inserted in the address field and the size of the radius (5, 10 or 25 km) be selected. By clicking on the *search* button, the perimeter of the local search restriction is drawn on the map. The selection must be confirmed by *ok*.



The buttons **Biology** and **Technique** will be activated at a later date.

As above, queries are executed with click on Nutrients of the roughage survey are displayed in g per kg of dry matter. By clicking on the *home* button, all search options are reset.

# 4.5 Detail Data – raw materials (password protected)

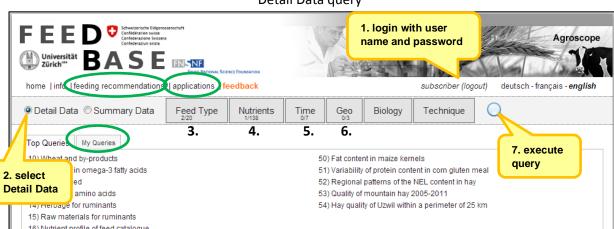
Except for the roughage survey, all further Detail Data of raw materials and forage are password protected and are only available on a subscription-based, paying access. Subscribers have to *login* to activate the extended functionalities

Once logged in, additional search menus are loaded:

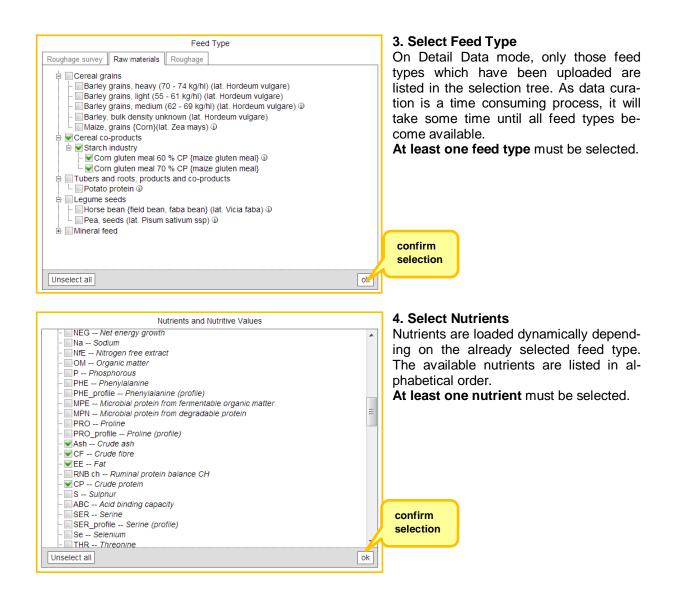
- Feeding recommendations → redirection to website of Agroscope (see chapter 7, Downloads)
- Applications → redirection to website of Agroscope (see chapter 7, Downloads)
- 3. Tab my Queries (see chapter 6, Create user defined top queries)

The *query schema* is analogous to the roughage survey except for additional functionalities:

- 1. Login with user name and password
- 2. Select Detail Data
- 3. Select Feed Type (Raw materials and/or Roughage)
- 4. Select Nutrients and/or Nutritive values
- 5. Select time options
- 6. Select geographic options
- 7. Execute query
- 8. With password: possibility to save the constructed query as a personalized top query (see chapter 6, Create user defined top queries)
- 9. Reset all search options



**Detail Data query** 



*Time options* and *geographic options* may be selected but they must not be restricted explicitly. Without marked check-boxes, data is assumed unrestricted and taken completely. The query procedure is the same as described above in chapter 4.4.

As above, queries are executed with click on \( \) Nutrients are displayed in g per kg of dry matter. By clicking on the **home** button, all search options are reset.

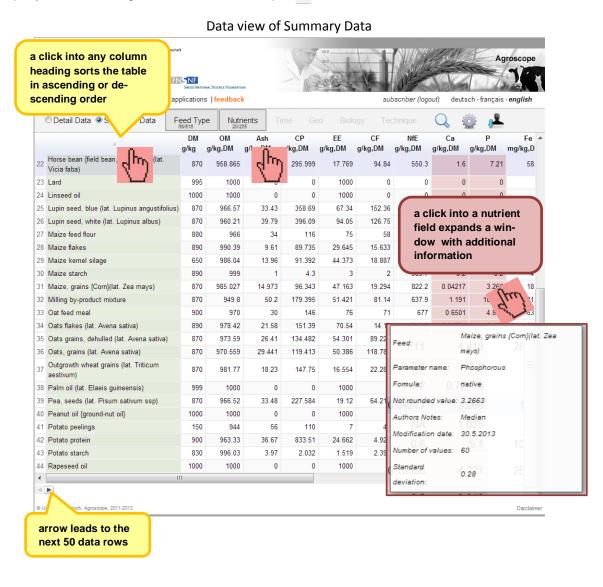
# 5. Data views of query reports

### 5.1 Data view of Summary Data

The results of Summary Data queries are displayed as **sortable table**, one nutrient per column and one feed type per row. By moving the horizontal and vertical scroll bars, the complete report can be investigated. Row number (data records) is limited to 50 at the most. To display the next 50 rows, the arrow at the lower left corner has to be activated.

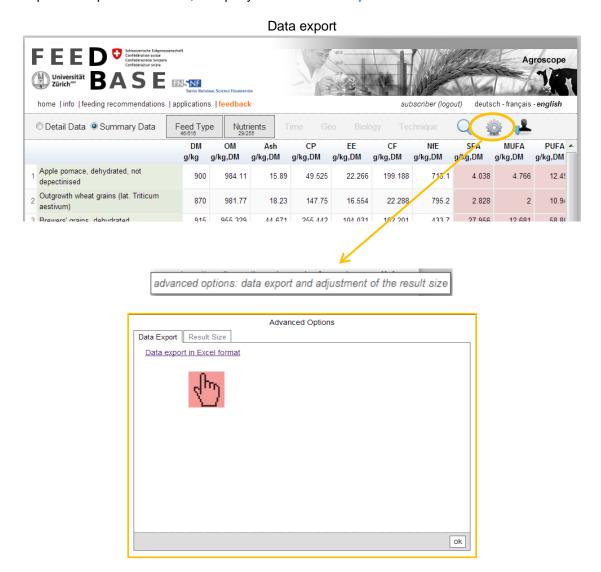
A click into any column heading sorts the table in ascending or descending order. A click into a nutrient field expands an overlay window with *additional information* such as sample count, formula used for computation of derived nutrients, date of last update. This information display also serves as orientation help in very large tables since feed name and nutrient definition is always given.

Feed type and/or nutrient selections can be modified (add, delete) at any time. To activate the change, the query must be run again with click on the loupe  $\bigcirc$ 



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In the password protected mode, the query results can be exported as Excel-file for further data use.



# 5.2 Data view of Detail Data (open access restricted to hay survey)

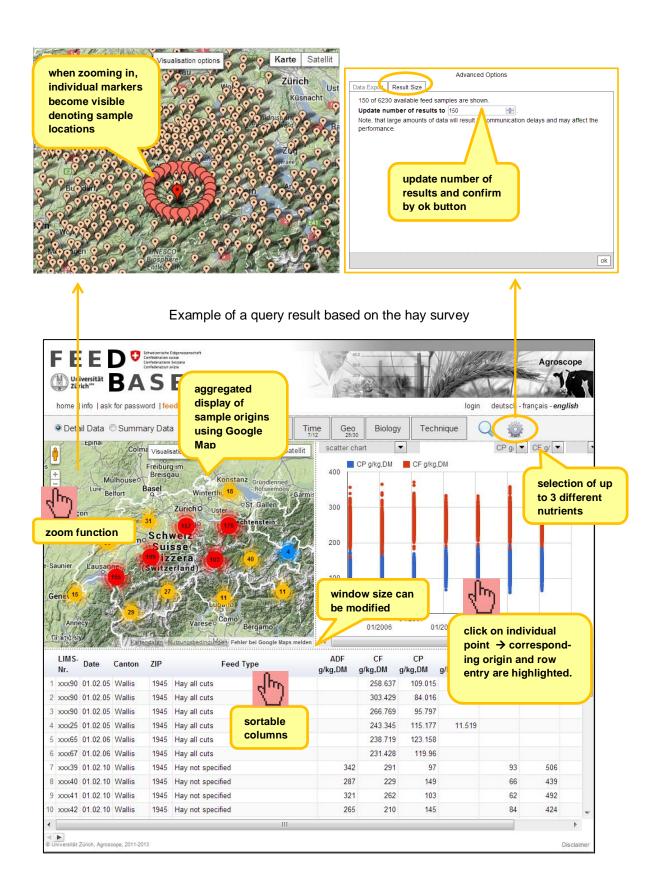
# 5.2.1 Interactive layout

The query results of Detail Data are displayed in three interacting windows each providing a specific data view:

- Google Map
- Scatter plot, statistic, region comparison
- Sortable list

The tabulated list of individual feed samples is interlinked with visual tools which interact when clicking on an individual sample on the map, the scatter plot or table row. Only geo-referenced feed samples are displayed on the map by a marker. The visualization options facilitate data interpretation and data analysis.

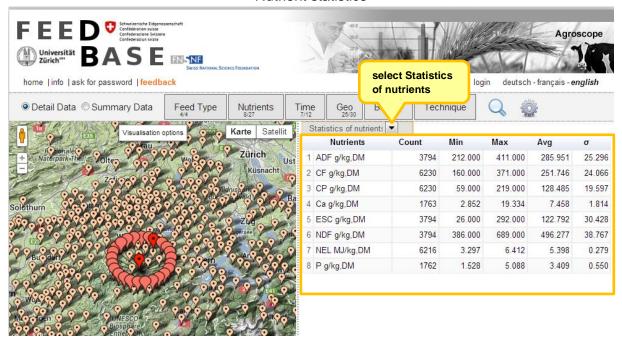
By default, result display is limited to **150 individual samples** as a large data volume will result in communication delays and may affect the performance. The result size can be modified manually by adjusting the number of shown results with the help of the button **Advanced Options** (see below). Thereby, all views of a given query result are adjusted to the updated result size.



#### 5.2.2 Nutrient statistics and region comparison

**Statistical details** extracted from chosen nutrients can be selected in the drop-down menu placed at the top of the scatter plot window section. Sample count, min, max, average and standard deviation are shown. In the same drop-down-menu, the tool **one-to-many-regions comparison** can be activated (see below).

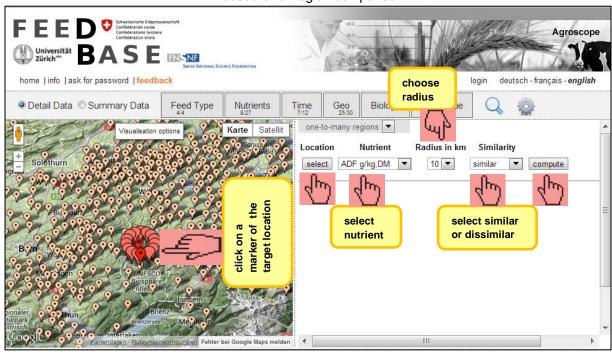
#### **Nutrient statistics**



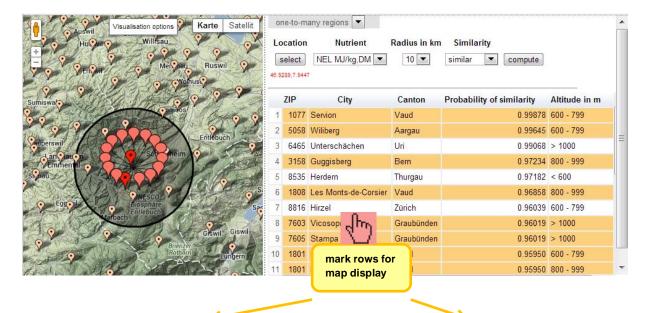
**One-to-many-regions comparison**: this tool computes the top 30 most similar or most dissimilar regions for a selected nutrient and a defined target location based on the probability of similarity. The underlying statistical procedure is a t-test.

Procedure: select target region by clicking the *select location* button. Move the cursor to a chosen target location and click on an individual marker on the map, select nutrient, choose radius, select similarity mode (similar or dissimilar) and click the button *compute*. The result is displayed as interactive list.

# Procedure for region comparison

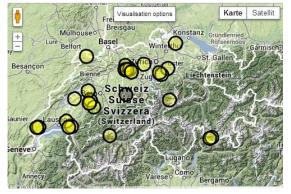


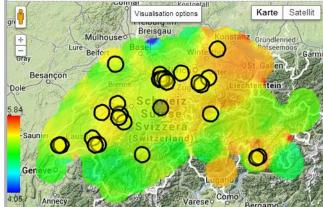
Result display of region comparison: top 30 regions having a similar NEL-content compared to the target location *Escholzmatt* 



Top 30 most similar regions

Top 30 .... with nutrient density (NEL) in the background



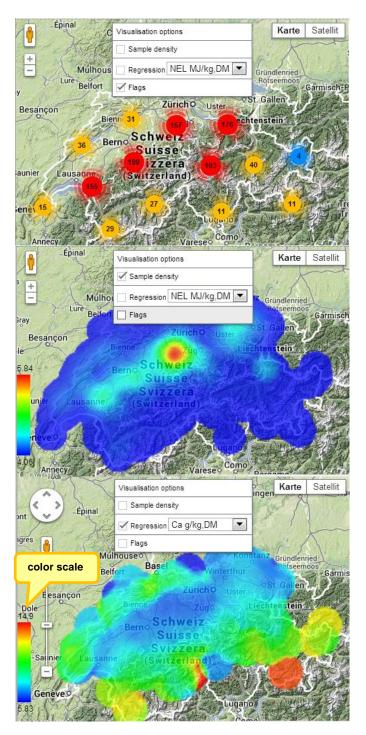


# 5.2.3 Visualization options Google Map

With Google Map, three visualization options are available:

- Markers depicting the location of sample origins.
- Sample density: colored density distribution of sample origins derived from kernel density function.
- *Nutrient density*: computation of the spatial nutrient concentration based on the bivariate kernel regression technique. Density values are colored according to a dynamic color scale.

Markers can be activated in combination with sample density or nutrient density. For meaningful, country-wide interpretation of color patterns, > 800 locations with samples are required. The georeferenced dataset of the roughage survey fulfills the required data volume for most nutrients.



The individual *markers* (flags) identifying a sample location become visible only after zooming in. For the given example, 1012 locations with hay samples are available.

The *density pattern* shown on the left clearly identifies a hot spot in sample origin. In the case of hay samples out of the hay survey, most come from central Switzerland. Blue stands for low density, red stands for high density. The color scale is dynamically generated for each query.

The color scale for *nutrient density* is dynamically generated for each query. In the shown example, Ca-content of hay samples range from 5.83 g/kg DM = blue to 14.9 g/kg DM = red.

The color pattern of Ca-content indicates a mountain-valley divide. Low Cacontents prevail in low altitude locations.

# 5.2.4 View of Detail Data (raw materials, password protected)

Subscribers have in addition to the roughage survey access to Detail Data of raw materials. The same data views as described above are available. If for a given nutrient more than one chemical method has been applied, then the query result displays the nutrient in columns distinguished by method. Under the denomination *indicative*, the value for a given nutrient is aggregated over all methods according to a priority schema. This way, maximum flexibility in data analysis and interpretation is sustained.

The visualization of the variation patterns along the time axis (scatter plot) is of particular interest for data exploration. For instance, possible time trends become manifest. The extent of observed variations provides the necessary indications for determining security margins. Also it proves to be a useful tool for outlier detection.

Schweizerische Eidgen Confédération suisse conféderation suisse conféderation suisse conféderation suisse conféderation suisse conféderation suisse conféderation suisse conféder login with user name Agroscope and password Universität BASE home |info |feeding recommendations |applications |feedback subscriber (loaout) deutsch - français - enalish Feed Type Biology Nutrients Time Technique • CP g₁ ▼ CP g₁ ▼ • Karte Satellit 680 620 560 Imported feedstuffs or feed with unknown for a given nutrient, 500 <u></u> 01/1990 01/1995 origin cause an empty methods of analysis map. are displayed in separate columns Google CP g/kg,DM CP g. g,DM Kjel... CP g/kg,DM indi... LIMS-Nr. Date Canton ZIP Feed Type Corn gluten meal 60 % CP (maize gluten 1 xxx-0 13.02.91 676.154 676.154 meal} Corn gluten meal 60 % CP (maize gluten 684 09 2 xxx-0 08 12 91 684 09 Corn gluten meal 60 % CP {maize gluten 699.616 3 xxx-6 25.06.92 Corn gluten meal 60 % CP (maize gluten 713 94 4 xxx-8 29 08 92 713 94 meal) Corn gluten meal 60 % CP (maize gluten 5 xxx-7 16 10 92 703.64 703.64

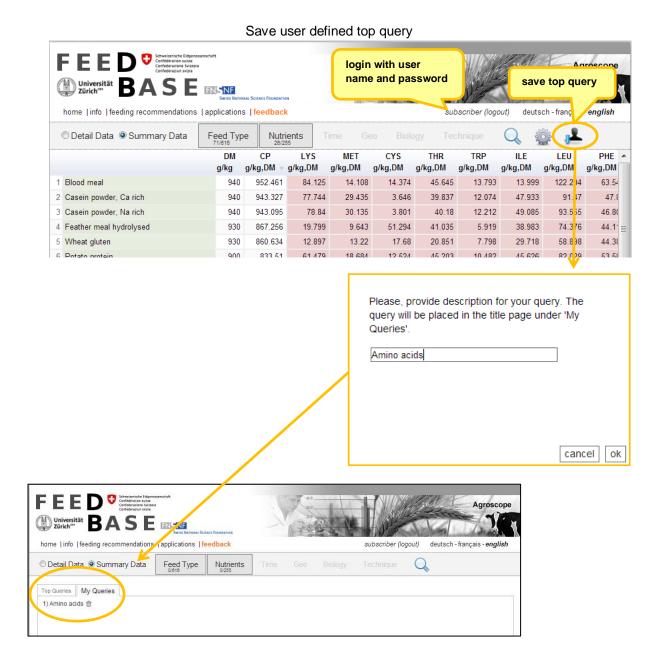
# Query result of 578 samples of corn gluten meal 60 % (password protected)

# 6. Create user defined top queries (password protected)

Corn duten meal 60 % CP (maize duten

In the password protected mode, frequently used feed and nutrient combinations can be saved as user defined top query for later reuse. These queries are stored on the home page under the tab *my queries*. To create a personalized query, the usual query construction schema as described above applies, i.e. select feed and nutrient options and run the query. Then click on the button *save your query*. In the appearing overlay window, subscribers are prompted to provide a description for the active query under which the query is stored for later use. Personalized queries can be modified or deleted without any restriction.

Personalized, saved query profiles shorten the effort to construct queries if the same feed and nutrient combinations are repeatedly and frequently used. In combination with the export function, these tailor-made queries prove to be very useful.

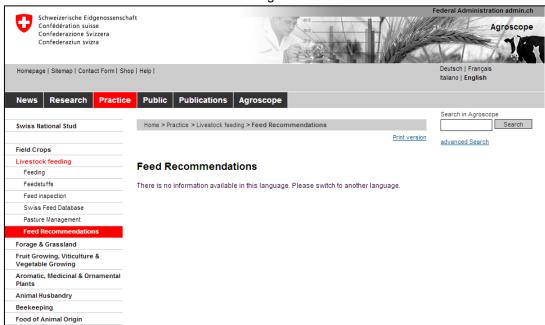


# 7. Downloads (password protected)

A click on the button *Feeding recommendations* and *Applications* redirects subscribers to the website of Agroscope where documents and Excel-files can be downloaded.



Unfortunately, these downloads are *not available in English yet*. English speaking subscribers have to switch to German or French for downloads.



### **Download Feeding Recommendations**

# 8. Contact

Research Station Agroscope Liebefeld-Posieux Tioleyre 4, P.O. Box 64 1725 Posieux Switzerland Tel. +41 (0)26 407 71 11 Fax +41 (0)26 407 73 00

Contact: Annelies Bracher (data curation)

annelies.bracher@agroscope.admin.ch

Monika Boltshauser (user management) monika.boltshauser@agroscope.admin.ch