

Interspecies Database Manual

Content of the Database

The Interspecies Database compiles anatomical, physiological, and biochemical parameters from various species to help scientists choosing the most appropriate animal species for their research questions. In addition, the database can assist researchers with the refinement, and ultimately also with the replacement, of animal experiments. Users have the flexibility to select various organs, species (and if applicable subspecies, strain or race), age groups, sex, conditions, and additional parameters to facilitate the comparison of values across different species. The database's filters provide the capability to discern interspecies variations by comparing parameter values among multiple species.

Filter definitions

Organs

The database includes data from the following Organs: intestine (small, large), gallbladder, kidney, liver, lung, mouth, oesophagus, stomach. Once the user clicks on 'Choose the organ' and type an organ of interest, the results will be shown in a drop-down menu to see all the parameters that match with it.

Species

The database includes data from the following Species: dog, human, monkey, mouse, pig, rabbit, and rat (including subspecies and strain or race options where applicable). These species were selected because of their common use in biomedical research.

Age Class

The Age classification is sorted chronologically following this sequence: fetus, neonate, infant, child, juvenile, adolescent, young adult, and adult. The categorisation of age classes is tailored to the distinct characteristics of the different species included in the database. For definitions we refer to Table 1.

Sex

Filter options are F = female, M = male and F + M= both sexes.

Condition

The Condition filter provides options for a diverse range of animals' conditions such as: pregnancy status, feeding status, PEEP, etc.

Parameters

The Parameter filter contains a variety of extra sub-filters that become visible after clicking on the "+" sign in front of the parameter name. Parameters are organized alphabetically.

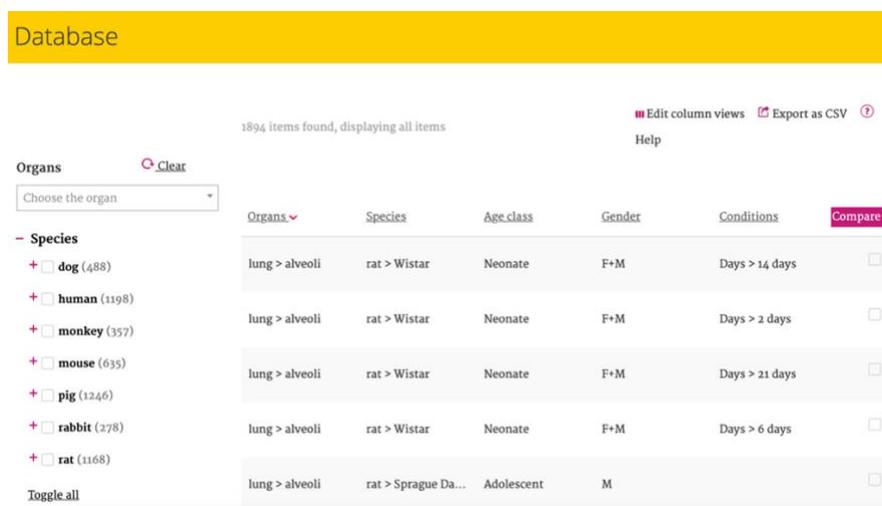
Table 1: Age definition across the different species. More detailed information on age classification regarding e.g. subspecies and body weight -including the references- can be downloaded [here](#).

Species	Age class	Age	Species	Age class	Age
Dog	Neonate	< 1 wk	Pig	Neonate	< 2 wk
	Infant	0.5 - 1.5 mo		Infant	0.5 - 1.5 mo
	Juvenile	1.5 - 7 mo		Juvenile	1.5 - 5 mo
	Adolescent	7 - 12 mo		Adolescent	5 - 7 mo
	Adult	> 12 mo		Young adult	7 - 24 mo
Human	Neonate	< 1 yr	Rabbit	Adult	> 24 mo
	Infant	1 - 5 yr		Neonate	< 1 wk
	Child	5 - 15 yr		Infant	1 w - 1.5 mo
	Adolescent	15 - 18 yr		Juvenile	1.5 - 4 mo
	Adult	> 18 yr		Adolescent	4 - 7 mo
Monkey (rhesus)	Neonate	< 1 mo	Rat	Adult	> 7 mo
	Infant	1 mo - 1.5 yr		Neonate	< 1 wk
	Juvenile	1.5 - 3 yr		Infant	1 - 3 wk
	Adolescent	3 - 4 yr		Juvenile	3 - 6 wk
	Young adult	4 - 7 yr		Adolescent	6 - 10 wk
Mouse	Adult	> 7 yr	Adult	> 10 wk	
	Neonate	< 4 d			
	Infant	4 d - 3 wk			
	Juvenile	3 - 5 wk			
	Adolescent	5 - 9 wk			
Adult	> 9 wk				

The use of filters and filter options

When no filter is selected, the database shows a screen with default results (Figure 1). The user can start a search by selecting an Organ: only one Organ can be selected at the time. Subsequently, the search can be refined by choosing Species (and if applicable subspecies, strain, or race), Age class, Sex, Conditions, and several additional Parameters. The Species and Parameter filter also contain sub filters that become visible after clicking on the “+” sign in front of name.

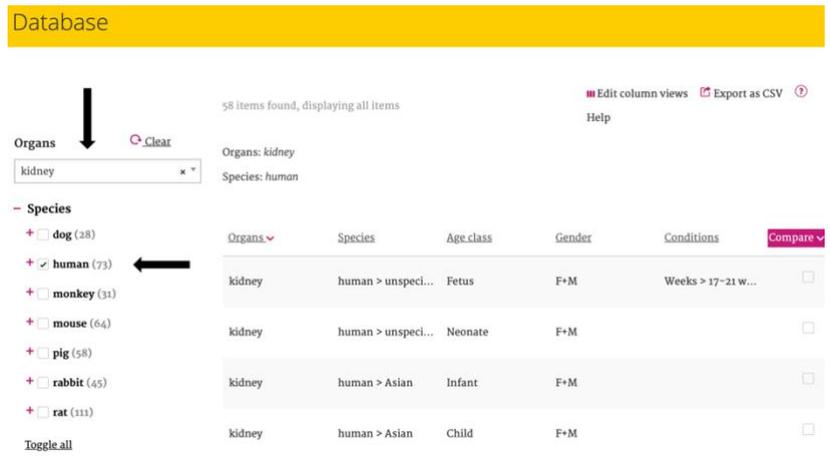
After selecting a filter option, the other available filter options are adjusted to this selection. The chosen filter options are displayed above the data table to keep easy oversight.



The screenshot shows the 'Database' interface. At the top, a yellow header contains the word 'Database'. Below it, a search bar is set to 'Choose the organ'. A sidebar on the left lists filter categories: 'Organs' (with a 'Clear' button), 'Species' (with a minus sign), and a list of species with checkboxes and counts: dog (488), human (1198), monkey (357), mouse (635), pig (1246), rabbit (278), and rat (1168). A 'Toggle all' button is at the bottom of the species list. The main area shows '1894 items found, displaying all items' and options for 'Edit column views', 'Export as CSV', and 'Help'. A table displays search results with columns: 'Organs', 'Species', 'Age class', 'Gender', 'Conditions', and a 'Compare' button. The table contains five rows of data, including entries for 'lung > alveoli' in rats and 'lung > alveoli' in Sprague Dawley rats.

Figure 1: Interspecies interface without any filter selection.

For example, when choosing the “Organs – Kidney” and “Species – Human” filter options, only parameters and conditions which are applicable to this selection are shown as further filter options. Behind each filter option, the number of available results is displayed between brackets (for example for “Kidney” there are 73 “Human” records – see Figure 2).



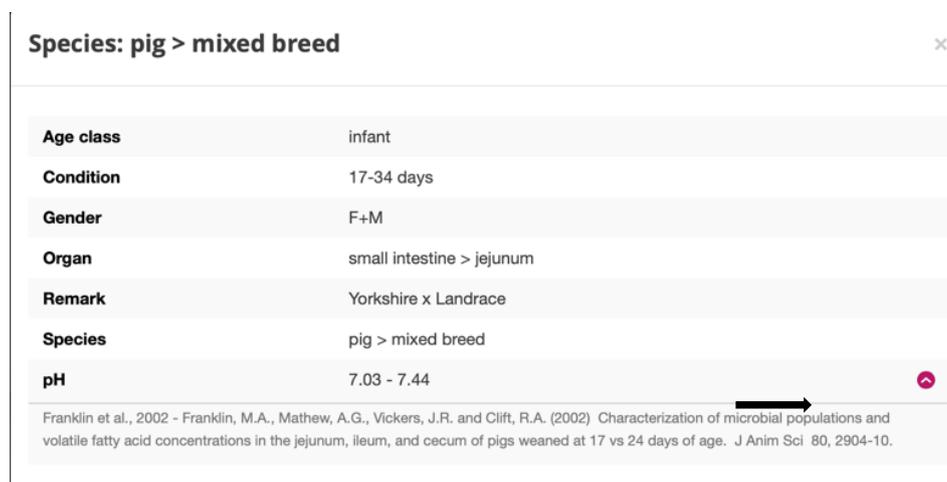
The screenshot shows the 'Database' interface. On the left, there are filter options: 'Organs' with a dropdown set to 'kidney', and 'Species' with a list of animals and their counts: dog (28), human (73), monkey (31), mouse (64), pig (58), rabbit (45), and rat (111). A red arrow points to the 'human (73)' option. On the right, the search results are displayed in a table with columns: Organs, Species, Age class, Gender, Conditions, and a 'Compare' button. The table shows 58 items found, displaying all items. The first row is: kidney, human > unspeci..., Fetus, F+M, Weeks > 17-21 w... The second row is: kidney, human > unspeci..., Neonate, F+M. The third row is: kidney, human > Asian, Infant, F+M. The fourth row is: kidney, human > Asian, Child, F+M.

Figure 2: Presentation of results after using the following filter options: “Organs – Kidney” and “Species – Human”.

Presentation of Results

The results of the Filter selection appear immediately on the screen with the Filter names as column titles in the display. Users can determine which Filters options are visible on the screen by using the 'Edit Column Views' option. Clicking on a Column title allows the user to sort the results. Long texts in the results screen are shortened. When moving over the text, the full text appears. By clicking on a result (anywhere), a pop-up window will appear with more detailed information.

In this pop-up window, all data that are available for the selected combination (organ, species, age class, sex, condition, parameters) are shown. For all data, references are available by clicking on the red arrow next to the parameter value (Figure 3). Animals of the same species (or subspecies, strain, or race) can differ on detailed characteristics that have not been added as a filter but that are visible in the pop-up window labelled as ‘Remark’ (Figure 3). Such Remarks may provide more information about e.g. breed characteristics but may also provide more detailed information on other parameters.



The screenshot shows a pop-up window titled 'Species: pig > mixed breed'. It contains the following information:

Age class	infant
Condition	17-34 days
Gender	F+M
Organ	small intestine > jejunum
Remark	Yorkshire x Landrace
Species	pig > mixed breed
pH	7.03 - 7.44

At the bottom, there is a reference: Franklin et al., 2002 - Franklin, M.A., Mathew, A.G., Vickers, J.R. and Clift, R.A. (2002) Characterization of microbial populations and volatile fatty acid concentrations in the jejunum, ileum, and cecum of pigs weaned at 17 vs 24 days of age. J Anim Sci 80, 2904-10. A red arrow points to the reference text.

Figure 3: Presentation of results with the red arrow indication the ‘click point’ to check the reference.

Comparing Results

To compare results, the user can select multiple boxes at the right end of each row and click on 'Compare'. This action will open the Comparison screen, displaying Filters and Parameters in rows and Species in columns. When the results for a particular parameter are the same across specie(s), the corresponding row is highlighted in green facilitating the identification of similarities and differences in details (Figure 4).

The rows in the Compare screen can be locked, so they will stay in position when scrolling up or down. More detailed information becomes visible by clicking on the Species name at the top. This action triggers a pop-up window similar to the one in the Results screen.

By clicking 'Back to overview' the user returns to the Results screen. Removing results can be done by clicking 'Remove' in the Compare screen or by untapping (deselecting) the boxes in the Results screen. If this is not done, the results will still appear in the Compare screen after another Selection session (even when 'clear' has been clicked) to allow comparison of multiple Selection sessions. Selected results can easily be removed by refreshing the internet browser.

Comparing 3 items Back to overview [Export as CSV](#) [?](#)
Help

	Remove ✕ <u>Species: rat > Wistar</u>	Remove ✕ <u>Species: rat > Wistar</u>	Remove ✕ <u>Species: rat > Wistar</u>
Organ	lung > alveoli	lung > alveoli	lung > alveoli
Species	rat > Wistar	rat > Wistar	rat > Wistar
Age class	neonate	neonate	neonate
Gender	F+M	F+M	F+M
Condition	14 days	2 days	21 days
Remark			

Figure 4: Highlighted in green are the similarities for different parameters after a query.

Additional features

The user can edit the display of the columns by clicking the 'Edit column views' button on the top right corner of the database. Furthermore, it is possible to export the search results to a CSV-file, by clicking the 'Export as CSV' button in the top right corner.

Note: To prevent that all results from differ columns merge into a single column after exporting, users need to use the 'text to columns' button to separate the contents of each cell into distinct columns (in Windows Excel).

Further questions?

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