

SGR

Flock Management System

Version 2.0 Build 20121106

User Notes

Raimundo Nonato Braga Lobo



**Brazilian Agricultural Research Corporation
Embrapa Goats and Sheep
Ministry of Agriculture, Livestock and Food Supply**

SGR - Flock Management System
User Notes (*Version 2.0 Build 20121106*)

Raimundo Nonato Braga Lobo

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1. Introduction

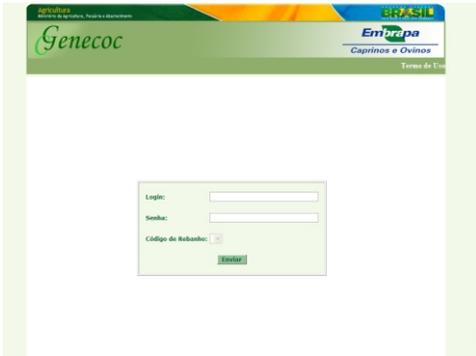
The Flock Management System (SGR) is a network software that allows the recording, storage and management of information generated in flocks of goats and sheep. Written using the PHP/HTML/Javascript languages this system has a free database (PostgreSQL) whose access is performed remotely via the Internet. The software allows you to manage information of meat, dairy and dual purpose flocks. The system is part of a complete package for managing and coordinating information used on breeding programs for sheep and goats. This package consists of an administrator and an user area. Administrators may perform database backups and queries via SQL commands as well as create and associate new users and flocks. Regular users may register new accounts (login and password), edit account information and use the flock management system properly.

Currently the system includes the following livestock selection and bookkeeping projects: Meat Goats and Sheep Breeding Program (**GENECOC** - <http://srvgen.cnpc.embrapa.br/genecoc/start.php>), Dairy Goat Breeding Program (**CAPRAGENE** <http://srvgen.cnpc.embrapa.br/capragene/start.php>), Dairy Sheep Breeding Program (**OVISLEITE** <http://srvgen.cnpc.embrapa.br/ovisleite/start.php>), Data Recording and Management System (**DREMS** - <http://srvgen.cnpc.embrapa.br/drems/start.php>) and Data Record

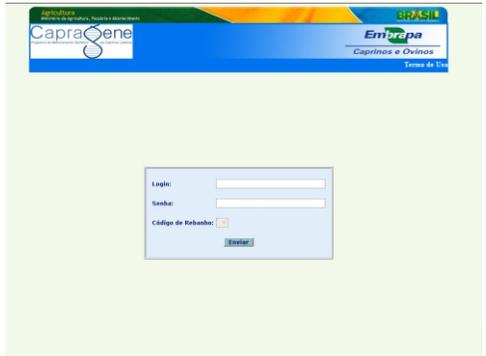
and Management System for Sheep and Goats (**DREMAS** - <http://srvgen.cnpc.embrapa.br/tsu/start.php>). The first three are coordinated by Embrapa Sheep and Goats and support Brazilian flocks. DREMS consists of a partnership between Embrapa and the International Center for Agricultural Research in the Dry Areas (ICARDA), to control flocks assisted by ICARDA in Africa and Asia, while the DREMAS support flocks in the United States and is coordinated by the Tennessee State University and Alabama Cooperative Extension System of Alabama A&M and Auburn Universities, in partnership with Embrapa Sheep and Goats.

The purpose of this manual is to provide much requested information to clear doubts and help system users get the most out of this software. We will also present step-by-step guidance for the graphics package.

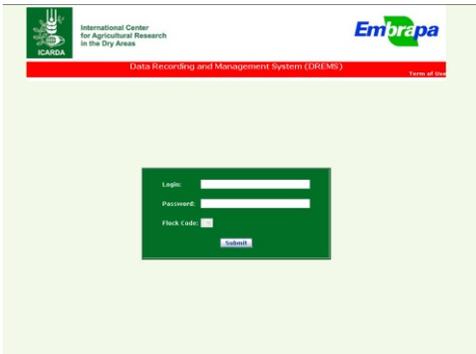
It is noteworthy that the system was tested using Mozilla Firefox and Internet Explorer, so it is recommended to use these browsers.
The system does not work properly in Google Chrome.



GENECOC - <http://srvgen.cnpc.embrapa.br/genecoc/start.php>



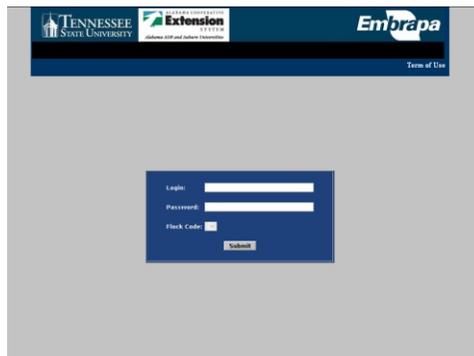
CAPRAGENE - <http://srvgen.cnpc.embrapa.br/capragene/start.php>



DREMS - <http://srvgen.cnpc.embrapa.br/drems/start.php>



OVISLEITE - <http://srvgen.cnpc.embrapa.br/ovisleite/start.php>



DREMAS - <http://srvgen.cnpc.embrapa.br/tsu/start.php>

2. System Structure

As presented previously, the package presents computational tools for system administrators and users in addition to the breeding program management system itself (Table 1).

Table 1. System structure for administering a breeding program for goats and sheep

Host	Links	Screens
http://srvgen.cnpc.embrapa.br/.../start.php	Administrator Area	Login Screen
		1. Create User
		2. Create Flock
		3. Associate User-Flock
		4. Other Services
	User Area	1. Password Record
		2. Change Password
	Management System (SGR)	

The system provides multiple levels of user permissions. The admin area should only be accessed by breeding program coordinators through secure login to create new users, flocks, etc. The user area can be accessed by any authorized user where one may record or change passwords whenever necessary. The Flock Management System (SGR <http://srvgen.cnpc.embrapa.br/.../system/sgr.php>) is the software for recording, storage and management of information generated in

goats and sheep flocks participating in the program. This area may be accessed by administrators and authorized users alike through their respective logins and passwords. The menu structure is shown in Table 2.

Table 2. Menu Structure of the Flock Management System (SGR)

1. Register	6.2. Animal
1.1. Flock	6.2.1. Flock
1.2. Flock Subdivisions	6.2.1.1. Current Flock
1.3. Pastures	6.2.1.2. Inactive Animals
1.4. Management Systems	6.2.1.3. Flock History
2. Flock	6.2.1.4. External Animals
2.1. Semen	6.2.1.5. Semen
2.2. Animals	6.2.2. Individual Form
2.2.1. External Animals	6.2.3. Flock Inventory
2.2.2. Internal Animals	6.3. Breeding Season
2.3. Inactive Animals	6.4. Events by Date
3. Events	6.5. Data Entry by Date
3.1. Reproductives	6.6. Health
3.1.1. Breeding Seasons	6.6.1. Disease
3.1.2. Matings	6.6.2. Exam
3.1.3. Diagnosis of Pregnancy	6.6.3. Vaccine
3.1.4. Lambing/Kidding	6.6.4. Individual
3.2. Productives	6.7. Management
3.2.1. Weights	6.7.1. Milk Recording
3.2.2. Visual/Morphometric	6.7.2. Reproductive/Lactations
3.2.3. Weaning Register	7. Bookmarks Collection
3.2.4. Milking Recording	7.1. Initial Register
3.2.5. Milk Content	7.2. Events Register
3.2.6. Lactation End	7.3. Matings
3.3. Animals Adoption	7.4. Control of Embryo Transfer
3.4. Managing Animals	7.5. Diagnosis of Pregnancy
3.5. Reversal of Events	7.6. Lambing/Kidding
3.6. Transfer Between Flocks	7.7. Weights
3.6.1. Transfer	7.8. Milk Recording
3.6.2. Accept/Reject Transfer	7.9. Visual/Morphometric
4. Health	7.10. Weaning Register
4.1. Registration of Products	8. Tools
4.2. Collective Events	8.1. Generate Text Files
4.3. Individual Events	8.1.1. Pedigree
4.4. Animals in Treatment	8.1.2. Pedigree Recoded
5. History	8.1.3. Weights
5.1. Reproductive/Lactations	8.1.4. Visual/Morphometric
5.2. Weights	8.1.5. Reproductive/Lactations
5.3. EPD	8.1.6. Milk Recording
5.4. Health	8.2. Insert EPD's
6. Reports	8.3. Selection by TGM
6.1. List	8.4. Inbreeding
6.1.1. Flock Subdivisions	8.5. Matings
6.1.2. Pastures	9. Help
	10. About System
	11. Exit

3. Procedures for Administrators

The breeding program administrator has the responsibility to manage the participating flocks. These tools are available in the Administrator Area (<http://srvgen.cnpc.embrapa.br/.../start.php>) and can be accessed by clicking on the desired tab. An activated tab can be visually identified by the change in its color tone. As a security measure, the connection will be closed by the system after 10 minutes without any activity. Just login again to establish a new connection.

3.1. Tab - Create User

One of the first procedures for managing the breeding program is to include the users who will access the system. This is done by adding the user's email address in the system and specifying if they will have administrator powers or not by selecting YES or NO on the corresponding checkbox. As administrators have access to all enrolled flocks it is important to restrict this kind of access to only those who manage the breeding program.

The next box indicates whether this user will be able to generate text files with information from the flock which may be used in statistical analysis. Restricting this action may be useful in case user access is created for typists whose only function is to insert information in the system.

Next, state the group to which this user should belong. Members of group '1' cannot make changes in the system and may only view information, history, issue reports and use the selection tools. This group can be used, for example, when performing a progeny test of encoded sires and you want the farmers to be able to access their property data for management of their own flock. Members of group '0' are clear to perform all actions within the system and may insert and modify data.

Finally, click the "Submit" button so the information will be recorded in the database and an email will be sent to the user with all information helping him to register in the system, on behalf of the administrator that posted the information.

3.2. Tab - Create Flock

In this tab the flocks that participate in the breeding program are registered. Fields followed by * are required. The name of the flock, the specie (goats, sheep or both), the name of the person responsible for the flock (may be the owner or a technician responsible for collecting information), the email of the responsible person, the country, the city and address of the flock, the aim of the program (meat, milk or double purpose) must be registered. It is noteworthy that defining the aim of the program will incur in specific available SGR options. For example, in meat producing flocks milk production related options such as milking record (Table 2, item 3.2.4), milk content (Table 2, item 3.2.5), management reports

(Table 2 , section 5.6), etc, are not active in the SGR menu.

If it is a community flock, with the participation of several farmers, their names must be specified in the corresponding text box. It is important that each name is entered on separate lines. For organizational purposes, it is recommended to input the names in alphabetical order. This record is important so animals registered in SGR may be associated with a specific owner.

3.3. Tab -Associate User-Flock

Once the users and flocks are registered, you must associate this information with each other. This procedure will allow SGR to grant owners access to their property data. This procedure is not necessary for administrators, since they have authorization to access all flocks. An individual farmer should be associated exclusively with his flock, avoiding access to information originating from the other ones. You can associate multiple flocks to any given user as it may be useful, for example, in cases where typists are responsible for inserting information from multiple flocks.

Select the user in the box and mark the corresponding flock to grant access to. Finally, click the "Submit" button and the information will be saved in the system. Note that when you select a user who has flocks associated with it, these flocks appear with their corresponding boxes marked. You can check or uncheck all the boxes at once by clicking the corresponding buttons.

Sometimes, after creating a user and flocks they may not

appear under this tab for the association procedures. If this occurs, click the link "Administrator Area" on the left of the screen and login again.

3.4. Tab - Other Services

In this tab several procedures useful to breeding program administrators are available. Be aware that these procedures can often take a long time to run, depending on the size of the database and computing power available. For the correct execution of the procedures, your browser should be allowed to display pop-up windows . Pop-up windows are extra windows that are opened in the browser when you visit a web page or access a specific link.

If necessary one can perform a local backup of the database by selecting the corresponding option and clicking "Submit." A dialog box will show where the generated file will be saved on your computer. The generated file will be compressed and contains the whole structure and data stored in the database in a way that can be retrieved using the standard procedures of the PostgreSQL system (<http://www.postgresql.org/docs/current/static/index.html>).

Text files containing specific information may also be generated. Check the option Generate Text File, select the file type to be generated (Pedigree, Weights, Visual/Morphometric, Reproductive/Lactations or Milk Recording) and select the flocks whose information you are interested in. If you want all the flocks, check the corresponding box. If you want only one or a few flocks

select them individually in the box of flocks. Some tips are important in the selection procedure: if you want only one flock, search for it and click on it; if you want a group of flocks that are listed together, simply press the left mouse button and drag to create a selection box; if the desired flocks are not listed next to each other, press the CTRL key on your keyboard and select them individually with the left mouse button. Click "Submit" and wait for the dialog box to open or download the generated file.

Advanced users may use SQL commands to perform the procedure mentioned above. Check the corresponding box, type your command in the text box and click submit. This allows a variety of queries to be performed in the various tables within the database. The output of these queries will be displayed on a new browser page or tab. It is also possible to save the query results in a csv file (semicolon delimited file).

4. User Area

The user area has two tabs, one for the login process and the other to change this password. Once users have been created by the administrator in **Tab - Create User** (item 3.1.), they will receive an email containing the address to the user area and instructions to access **Tab - Password Record** to register to receive access. New users must inform an email address and enter their individual codes and passwords for system access . Users may choose any username and any password containing letters and numbers. The

password must be entered twice for proper confirmation. It is the responsibility of users to keep their logins and passwords safe in order to avoid the compromise of registered information. System administrators are not responsible for damage caused by misuse. To register system access, the user must read and agree to the system's terms of use, available through a link on the top right of the page.

If you want to change your password, go to **Tab - Change Password**, enter your code (login) and password and type a new one.

5. Flock Management System (SGR)

In order to access SGR, the user must enter a username and password, previously generated in the User Area, **Tab - Password Record**. If the user is an administrator or if he is responsible for a group of registered flocks, he should choose in the box the flock that he wants access to. If the user has access to only one flock, it will automatically appear in the selection box. After the login process the user will have access to the menu shown in Table 2. If the user does not perform any action within 10 minutes the connection will be closed by the system.

It is important that system users have an organized way to manage the information generated on the flock. Data should be entered following the flock and animal daily routines, ie,

birth, growth, weaning, pos-weaning, culling, sale, slaughter, mating, diagnosis of pregnancy, lambing/kidding, death, dairy control, end of lactation, among other events.

Productive (weights, measures, dairy control, composition of milk, end of lactation etc.) and reproductive (matings, diagnosis of pregnancy, lambing/kidding, etc.) events must be placed in chronological order of occurrence, i.e., from the first to the last occurrence in the animal's life.

Specific help information for procedures associated with the data are available as links on the right of the screen. Users that have no information (zootechnical bookkeeping) regarding productive and reproductive occurrences should proceed as follows:

1. Print the initial register form that you find in Menu Bookmarks Collection - Initial Register (Table 2, item 6.1). In this form you will enter individual and unique identification codes for each animal (tags, platelets, Breed Association registry numbers), category (lambs/kids, weaners, ewes/does, rams/bucks etc..), sex, sire, dam, weight etc.. Animal identification codes must be unique for each individual as the software will not allow two animals identified by the same code. Once the form is filled with the appropriate information proceed to insert it in the system.

TIP!! Prevent loss of identification codes by using at least two systems such as tags and tattoos for example. Tattooing can be made in the animal's groin. This will increase security in animal identification and prevent future problems within the flock.

2. Controlled mating is essential in breeding programs. It is necessary to know who are the parents of each offspring, so manage males and females separately. Use ruffians (teasers) to identify females in estrus and thus perform controlled mating. If this is not possible, perform breeding seasons, with lots of 30-40 ewes/does for each sire. We are still improving the system to deal with flocks where mating is not controlled.

3. You cannot make improve your flock without measuring animal weight (meat flocks) or dairy control (dairy and dual purpose flocks). It is imperative to weight your animals and/or perform dairy control regularly. Weight values are paramount at birth, weaning, about 7-8 months, around a year old and at the time of matings and lambing/kidding. However, if possible, try to weigh your flock monthly or bimonthly. The dairy control must be done at least bimonthly.

4. Avoid allowing too much time to pass between events in your flock and data entry. The closer they occur the lower the occurrence of inconsistencies and the better the quality of your evaluations.

5.1. Register

It is of paramount importance that the property is properly identified and characterized. This part of the Menu allows the registration of information characterizing the physical environment of the flock.

5.1.1. Flock

This screen should be used to identify the flock with as much detail as possible , using the available fields. The form is divided in a section for recording flock information and one with the farmer data. This is important because some farmers do not reside on the property.

Flock information fields include name, address, neighborhood, city, zip code, state, directions to reach the property, telephone number, fax number, CGC, state registration, technician name and his professional ID number. Contact information is necessary in cases the need arises to reach the person responsible for inserting information in the system be it the owner (breeder) or a technician. CGC or CNPJ can be found on the National Registry of Legal Entities. If the flock does not have legal status, inform the owner's CPF (National Registry of Individuals). The state registration is the taxpayer's registration maintained by the Internal Revenue Service (IRS). If the flock has a technician in charge, include his name in the corresponding field, followed by his professional ID number. A detailed route to the property can be described in the itinerary field.

Farmer data include name, address, neighborhood, city, zip code, state, phone, fax, email, species, country, flock purpose and registration date. The latter is automatically filled when the flock is

registered. The contact name can be from one person representing the property owner.

It is essential that property name, owner's name, address, phone and email are up to date, allowing untroubled contact between the scientific team and the farmer. The state record fields are only available for the U.S. and Brazil.

5.1.2. Flock Subdivisions

Here you can see, change, delete or add data concerning flock subdivisions. The registration of flock subdivisions allows the creation of divisions within a farm, thus improving information organization. It is known that subdivisions are common within a property, such as areas of rearing, fattening, breeding etc, or even discontinuous areas of the same property. The registration of flock subdivisions is mandatory within the system and at least one must be included. Its use facilitates handling and identifying the location of specific animals, as can be the case within large flocks.

To search for a flock subdivision, enter its code in the field next to 'Search for Flock Subdivision Code' and exit the field using the TAB key on your keyboard. If you want to delete a flock subdivision, just click 'Delete'. The system can only delete subdivisions that contain no animals. If you wish to view / edit registered information, click the left mouse button on its code.

If you need to register new flock subdivisions, click on the corresponding button. The screen that opens to edit or add a new

flock subdivision contains fields such as code, name and area. Use any unique integer to register a new flock subdivision code and it is important to name it. Names may contain up to 30 characters, including spaces. The area field is numeric and must be filled in hectares.

5.1.3. Pastures

Here you can check, change, delete or add data regarding different pastures for each lot within the property. Pasture registration is important for the control of lots of animals in the various areas within the property, for example, a batch of lambs/kids routed to a specific pasture for termination on a given date. This way, you can track the movement of groups of animals from lot to lot within the system. Registration of pasture, though important, is not obligatory for the system.

To search for a pasture, enter your code in the field next to 'Search for Pasture Code' and exit the field using the TAB key on your keyboard. If you want to delete a pasture, just click 'Delete'. The system only deletes pastures that contain no animals.

If you want to check / edit information of registered pastures click with the left mouse button on their code. To register a new pasture, click on the corresponding button.

When you open the form to edit or insert a new pasture, you can use any unique integer as code. It is important to name the pasture. Names may contain up to 40 characters, including

spaces. The area field is numeric and should be completed in hectares. The flock subdivision where this pasture is located should also be informed. Select the type of pasture, i.e., whether native, cultivated or improved (with environmental modifications for improvement). Select the topography type and water supply for animal consumption. The observation field is available to include any information deemed important.

5.1.4. Management Systems

The system already includes standard management systems: 1) Extensive - Native Pasture; 2) Extensive - Cultivated Pasture; 3) Semi-Intensive - Native Pasture and Roughages; 4) Semi-Intensive - Native Pasture and Concentrate; 5) Semi-Intensive - Native Pasture, Roughages and Concentrate; 6) Semi-Intensive - Cultivated Pasture and Roughages; 7) Semi-Intensive - Cultivated Pasture, Roughages and Concentrate; 8) Intensive - Roughages High Quality; 9) Intensive - Roughages High Quality and Concentrate. However, it is important that each owner register their own systems, identifying the practiced management properly. Here you can check, change, delete or add the management systems adopted in the property. The registration of these systems is very important to monitor and control the productive performance of the animals. Once genetic evaluations and performance differentiation of animals are done, it is possible to adjust the data according to these systems in order to make a proper comparison.

Here it is possible to register whether a given group of animals is under preferred treatment, such as preparation for exposition fairs or receiving some experimental diet. Managements registered here can be associated with registration of weighing, matings, lambing / kidding, etc.

If you want to delete a management system, just click 'Delete'. If you want to check / edit information of registered management systems, click on it with the left mouse button. To register a new management system, click on the corresponding button. When editing or inserting management systems, fields are available for the name of the management system, which may include up to 39 characters including spaces, and a description field where detailed information about the management system may be entered.

5.2. Flock

This menu item allows the description and registration of animals in the flock. To register the animals in the system, each one must have a registration code, which must be unique and exclusive, as a record of identity. If animals are recorded in a breed association, you should use the registration code of the association. However, the animal does not have this code at birth. Thus, it is important that the breeders have their own identification system. This code can contain letters and numbers up to 12 characters. As an example of coding, a breeder can use the flock

code or letters of its name, plus sex, plus the year of birth, plus the birth order of the animal. Thus, the first male animal born in 2011 in the flock of Embrapa Goats and Sheep could receive the code 01M2011001 or CNPCM2011001 and so on. Later, if the animal receives a breed registration number by an association, the initially registered code can be substituted by the new one.

It is important that farmers use at least two identification systems for the animal, e.g., tags or necklaces with platelets, and tattoo. This is important because often tags or necklaces can be lost. Furthermore, these are important for quick visual identification at a distance without having to hold the animal. Thus, when generating an identification for the animal, it may be tattooed on the animal's groin, or any other area such as ears, as long as areas used by breeders associations to register animals remain free for their use. The animal should receive a tag or necklace to aid in identification. Common numbered tags can be used, however nowadays it is possible to find blank tags where the identification number can be written. These are quite interesting so that the same code can be written in the tag and tattooed on the animal.

It is also important to assess the age of the animals at registration. If the date of birth of the animal is unknown, evaluation by dental chronology may be helpful. The first change (middle pair of Incisors) occurs at around 12 months, the second in the next 24 months (2nd pair of permanent Incisors), the third at 36 months (3rd pair of permanent Incisors) and the fourth change

occurs at around 48 months of age (4th pair of permanent Incisors). However, this can vary with genetic groups, feeding regimens, regions, etc.

5.2.1. Semen

If the farm uses externally acquired semen , this screen allows one to check, view, change, or delete the registration of semen donors for the material in use on the property.

To search for a semen, enter your code in the field next to 'Search for Semen Code' and exit the field using the TAB key on your keyboard. If you want to delete a semen, just click 'Delete'.

Attention! Delete does not mean discarding, so only use this command for cases in which there was some mistake in the registration and this semen really does not exist. The system deletes only semen codes that have no registered offspring in the flock.

If you want to check / edit information of previously registered semen, click with the left mouse button on its code. To register new semen, click on the corresponding button. To recode a semen use the "Change code" link and a window will open so that one may add the new code.

Information associated with semen are of paramount importance so add as much as possible. Some specific fields are unavailable and address information that is not important in these

cases. Details about this form will be discussed later in this text as it is the same form used when including a new animal in the flock.. To register semen, the code of animal, the date of registration and breed are required fields.

5.2.2. Animals

5.2.2.1. External Animals

This screen allows the inclusion of information about external animals, i.e., from other flocks such as parents of purchased animals.

Attention! An external animal is one that is not physically on the property, and thus cannot be measured, etc. The animals that are not owned by the farmer, but are physically in the flock, such as borrowed animals, must be registered as internal animals.

To search for an external animal, enter its code in the field next to "Search for External Animal Code" and exit the field using the TAB key on your keyboard. If you want to exclude an external animal, just click 'Delete'.

Attention! Delete does not mean discarding, so only use this command in cases where there was some mistake in the registration and this animal really does not exist. The system only deletes animals that do not have registered offspring in the flock.

If you want to check / edit information about registered animals, click on its code with the left mouse button. In order to register a new animal click on the corresponding button. To recode an animal use the "Change Code" link and a window will open so

one may insert the new code.

When registering or editing external animals some fields may be unavailable as they refer to information that is not important in this case. Further details about the animal registration form will be presented in the next section. Code, sex, category, date of registration and breed are required fields when registering external animals.

5.2.2.2. Internal Animals

This screen allows the inclusion of animals in the system and consulting animals already registered. All animals within a flock must be registered. Here you can add, view, modify code, delete and cull any animal of the system.

To search for an animal, select the type of search, whether by code, tag, name or register, enter the information in the field next to 'Search for Internal Animal' and exit the field using the TAB key on your keyboard. If you want to exclude an animal, just click 'Delete'.

Attention! Delete does not mean discarding, so only use this command in case there was some mistake in the registration and this animal really does not exist. The system only deletes animals that have no offspring in the flock.

If you want to check / edit information of a previously registered animal, click with the left mouse button on its code. To register new animals, click on the corresponding button. To

recode an animal use the "Change code" link and a window will open so one may insert the new code.

If you want to cull of the animal using this screen, click the "Cull" link. A new window will open with the code of the animal and two fields that should contain date and reason for culling. The available reasons are: Age, Cripple, Disease, Growth Development Unacceptable, Hoof, Low Production / Maternal Ability, Other, Reproductive Failure, Return Loan, Temperament and Teat Defective. Additional ways of culling will be discussed later on.

The form for editing or inserting a new animal was built to record key information and to characterize it. This is the same form used to record semen and external animals, and this will be described in detail here. Registered information is of paramount importance, so it is recommended to register as much as possible.

Code: each animal within the system must be identified by a unique code that can contain up to 12 letters and numbers according to your need. Even if the animal is removed from the flock its code cannot be assigned to another animal. Use the tips discussed in section 5.2 to register the code of an animal,. In the case of animals registered by Breed Associations it is recommended that the association code should be used in the registering process.

Tag number is also important as it facilitates daily management of the animals within a flock.

The register field must be completed if the animal has been registered by an association even if this number has been

previously used as the animal code. The register type field should only be used in Brazilian flocks, according to the codes used by the sheep breed (Base, Prov I, Prov II, Prov III and Pure) and goats breed associations (FM, LA 1, LA and Pure). If the animal has a name, enter it in the corresponding field. This field is optional and may contain up to 40 characters.

The date of birth should always be informed when possible. For animals born on the farm and included at lambing/kidding, this field is filled automatically.

The category any given animal falls in will depend on its sex. For males, the available categories are Lamb/Kid, Weaner, Sire, Ruffian (teaser) and Finishing. For females, the categories for meat flocks are: Lamb/Kid, Weaner, Young Female Open, Young Female Mated, Young Female Pregnant, Female Open, Female Mated, Female Pregnant and Finishing. For dairy or dual purpose flocks, the females categories are: Lamb/Kid, Weaner, Young Female Open, Young Female Mated, Young Female Pregnant, Female Dry Open, Female Lactating Open, Female Dry Mated, Female Lactating Mated, Female Dry Pregnant, Female Lactating Pregnant and Finishing.

To inform the sire and dam of the animal, you must first register them as the system only allows assignment of previously registered parentals. Animals that do not belong to or are not in the flock must be registered as externals. Parental information is optional but should be provided if available. Search for parentals may be done by clicking on the search button. This will open a

popup window where the search can be made based on code, tag, name or register. Select the kind of search and enter the desired information. Exit the field using the TAB key and the system will search for the sire / dam. Once they have been found click on "Submit". Note that the window will be closed and the available information will appear in the corresponding fields on the form of the animal (code, register, name and breed of sire / dam). No entries are accepted for codes of parents whose data are not available in the system. In this case parentals should be registered followed by the registration of their offspring.

The specific type of registration that is being performed should be informed whether it is a birth record, an initial registration (in the case of first users), or in the case of purchases and loans. In the case of birth records, this field is automatically filled and the date of registration will be the date of birth. For other types of registration, the date is automatically filled with the current date but it can be modified as in the case of purchases, loans and other situations related to including the animal in the system.

The origin of a registered animal will be automatically filled with the name of the farm in case the animal was born in the property. However, this field can be edited in cases where the origin differs as with purchased animals.

When registering a birth, the weight field should report the birth weight and will be automatically filled if there is only one offspring. . If there are multiple offspring then weight fields must be filled manually. For other registration types such as purchases,

record the actual weight of the animal at the time of registration. The weight must be entered in accordance with the date it was measured. The inclusion of weight on this window is not mandatory.

The system allows the registration of crossbred animals, comprising up to five breeds. If the animal has known parentals, breed information may only be registered by clicking the "Assign Breed" button. This is done in order to avoid errors in the registration of genetic groups for crossbred animals. If a parent is not known, this procedure cannot be used and one may select the number of breeds that make up the animal. For example, if the animal is purebred, select 'Pure' options, then click on the 'Search' button to get a list of available breeds. Select and confirm the desired breed. Notice that the breed field was completed in the animal form. For animals composed of two or more breeds, check the option according to the number of breeds that make up the animal. Click the search button and select the desired breeds. Once breed selection has been finished the window will close and the fields addressing these breeds in the animal form should be filled. Then position the mouse cursor on the field in front of the selected breeds and report their proportion in the animal breed composition, for example, 5 in the first field and 8 in the second field will determine a 5/8 composition. The sum of the proportions should be equal to one Repeat the process for the other breeds. Animals composed by more than five breeds should be registered as Unknown Breed (SRD), or with the five predominant breeds in its

composition.

Enter the type of birth, whether single, double, three or more. Enter the animal's coat by clicking the 'Search' button to find available options. Enter the flock subdivision code and pasture where the animal is located, using the 'Search' button to see the available options.

In the case of conservation animals select the descriptors for genetic characterization such as the presence of wattles, horns and beard, and the degree of muzzle and hoof pigmentation.

The observations field should be used to record all relevant information regarding the animal's life which are not available in this form. In the case of communal flocks, select the name of the animal owner. It is noteworthy that the fields relating to animal code, sex, category, date and type of registration, flock subdivision and breed are required fields. If the registration type is birth, date of birth becomes mandatory.

Attention! Animals that have information acquired prior to its acquisition date such as birth, growing, weaning weights, etc, may have these values included after the registration process, in the Menu Events - Productives - Weights.

5.2.3. Inactive Animals

This screen contains a list of all animals in the flock that were culled, slaughtered, sold or are otherwise dead, i.e., no longer active in the flock. Through this window you can check the

information associated with the animal. Maintaining the archive of inactive animals is very important and it may be edited if an animal was wrongly assigned to this list. To return an animal, and all its associated information, to the active condition use the "Return" link.

To search for an animal, select the type of search, whether by code, tag, name or register, enter the information in the field next to 'Search for Internal Animal' and exit the field using the TAB key on your keyboard. Click on its code to see information associated with this animal. The window that opens shows the formulary of the animal, with all fields inactive, except for the fields of sex, category, culling date, culling reason and cause of death (when the culling reason was death). These last three fields are not available in forms for semen, external animal and internal animal. However, we will not describe them here, but in the culling procedures that will be presented later.

5.3. Events

All occurrences within the property may be recorded within this section. It is important to keep the records in chronological order and long periods of time between the occurrence and its insertion in the system should be avoided.

5.3.1. Reproductives

5.3.1.1. Breeding Seasons

Breeding season periods with or without controlled mating may be registered within this section. Breeding seasons without controlled mating require groups of 30-40 ewes/does that must remain with a particular sire for the establishes time period. Contact with other males should be avoided in order to avoid doubts regarding offspring paternity. Larger groups may be used in breeding seasons with controlled mating; however a teaser (ruffian) must be used to detect females in estrus. It is recommended to use one teaser for every 30-40 females.. Once females in estrus are identified they are placed in contact with the desired sire or may go through artificial insemination processes.

Breeding seasons should last no longer than 45 days and allow for the standardization of lots, simplifies management and introduces periodicity as animals mature and are slaughtered as groups.

If you want to delete a breeding season record, just click 'Delete'. Breeding season records may be checked and edited by clicking with the left mouse button on its code. New breeding seasons may be registered by clicking on the corresponding button. A new window will open and the beginning and finishing dates for a season may be edited or inserted. The number of females in any given breeding season is informed automatically by the system and considers only females that have not mated, are not pregnant and

are of reproductive age. This number may be edited if necessary. Click the “Submit” button to save the information.

5.3.1.2. Matings

Matings, inseminations or inovulations (in the case of embryo transfer) may be registered in this section.

Select the reproductive system associated with the animal: breeding season with or without controlled mating, or controlled mating without breeding season (continuous matings throughout the year).

Use the “Search” button to find a specific animal or enter the desired code. When searching, a pop-up window will appear where it is possible to query the list by code, tag, name or register. Select a parameter, type the information and exit the field using the TAB key. Once the animal has been located, click 'Submit'. Note that the mating screen will display the female code.

The system will only allow recording of previously registered females or that are in categories Weaner, Young Female Open or Female Open in case of meat flocks, and Weaner, Young Female Open, Female Dry Open and Female Lactating Open for dairy or dual purpose flocks. If you enter a nonexistent code or animal that is not in one of these categories, the system will prevent the registration of the information. If the code of the animal exists but it is in a different category this will have to be changed in the Menu Flock - Animals - Internal

Animals (edit) in order to allow the recording of the information.

Enter the date of the occurrence. For breeding seasons without controlled mating, enter the starting date season. The system will check for previously registered seasons. New seasons must be registered using the Menu Events - Reproductive - Breeding Season.

Enter or select (button 'Search') the sire (ram/buck) code. Searches may be performed in the same manner as described for females. The system will verify the existence of this code as the sire must have been previously registered in the system. If you do not know which sire was involved in the mating leave the space blank.

Enter the weight (in kg) and body condition (score 1-5) of the female at the occasion of mating. This information is not mandatory, but very important for the evaluation of the animal.

Select the types of estrus (natural, induced or synchronized), mating (natural, artificial insemination or embryo transfer) and management (the standard management systems included in the software and those registered in the Register Menu - Management Systems).

In case of embryo transfer (ET) the donor field will be enabled. Type or select the female embryo donor via the pop-up window. It is noteworthy that for ET, the animal code field must correspond to the embryo receiver, not the donor.

The observation field may contain any information deemed important. Click "Submit" to save.

Important! After the matings are included, the second step is the diagnosis of pregnancy. Pregnancies can be positive or negative. If positive, the third step is to enter the lambing/kidding for the females. If it is negative, the female may be forwarded to a new mating. If the female mated more than once, in different dates, enter the first mating date, perform a negative pregnancy diagnosis and proceed to the next mating. Repeat the process for each subsequent mating that may have occurred. Keep mating records in chronological order as the system will not allow the registration of previously occurred matings.

5.3.1.3. Diagnosis of Pregnancy

This window will only show animals that were registered as Mated Young Female or Mated Female, for meat flocks, and Mated Young Female, Mated Female Dry or Mated Female Lactating, for dairy or dual purpose flocks. An empty table means that no animals are available for pregnancy diagnosis or there may be some error with the animal category assignment. Should you not find a particular animal, check its registration and assigned category. You may correct the category using the Menu Flock - Animals - Internal Animal (edit) in order to register the diagnosis.

Select animals and their respective mating dates to check the pregnancy diagnosis. To search for a particular animal, select the type of search, whether by code, tag, name or register, enter the information into the Search for Ewe/Doe and exit the field using the TAB key.

Select animals on the table to your left, click on the 'Add Animal' and they will be sent to the table to your right. In this manner you may create lists containing animals mated in specific dates and selected for specific diagnosis results. Animals selected by mistake may be removed from the list by clicking the "Remove Animal" button.

Enter the date of diagnosis and select the result (positive or negative) and click 'Submit'.

Attention! Pregnancy diagnosis is mandatory. The animals will only be available for lambing/kidding registration or new mating after this procedure. If the farm does not diagnose pregnancy, wait for birth to occur and make the diagnosis of pregnancy before register the lambing/kidding, or if you notice that the animal was not pregnant with the mating, record the negative diagnosis. Periodically check the system for animals that do not get pregnant (that should have lambing/kidding) to record a negative diagnosis.

5.3.1.4. Lambing/Kidding

Occurrences of lambing/kidding for females diagnosed as pregnant are recorded in this window.

Enter or select the female using the 'Search' button. Searches may be done by code, tag, name or register. Select the type of search, type the information in the 'Searching for Ewe/Doe', and once the system has located and selected the animal, click 'Submit'.

The system will only allow this record for previously registered females in the categories Young Female Pregnant or Female Pregnant, for meat flocks, Young Female Pregnant, Female Dry Pregnant or Female Lactating Pregnant in dairy or dual purpose flocks. If you enter a nonexistent code or an animal that is not in one of these categories, the system will prevent the registration of the information.

When entering or selecting the correct code, the system will automatically fetch the information recorded at the time of and fill the fields date of mating, sire (ram/buck), lambing/kidding order and number of services per conception. If any of this information is wrong, the mating record must be first corrected before entering lambing/kidding.

Enter the date of the occurrence. Enter the weight (in kg) and body condition (score 1-5) of the ewe/doe at lambing/kidding date. This information is not mandatory, but very important for the evaluation of the animal.

When selecting the type of birth, the field sex of the offspring will be enabled. The type of birth can be simple (one lamb/kid), double (two lamb/kid), three or more. The sex of the offspring depend on this option may be one female, one male, one male and one female, two males, two females and others. In case of abortion or stillbirth select the option in the field sex of offspring. Also indicate the type of lambing/kidding, if normal, assisted or caesarean. Perform the weighing of the lambs/kids and report the sum of their weights in the field litter weight at birth. If there is only one lamb/kid

type its weight; if one lamb/kid with 2.3 kg and another with 3 kg, should be entered 5.3 kg in this field.

Select the management to which the animal is subjected. Here will appear the standard management systems included in the software and those registered in the Register Menu - Management Systems. The Observations field may be used to record any information deemed important.

The fields for identification of lambs/kids will be enabled according to the choice of type of birth and sex of the offspring. For single births, one field will be enabled, to double two fields and so on. Enter the code of lamb/kid on the field and press TAB to leave, a pop-up window will appear so the animal may be registered in a similar manner as internal animals. Some information will be automatically provided. In the case of simple birth, the fields of animal code (lamb/kid code), sex and category (Lamb/Kid), date of birth, sire's code and dam's code, sire's breed and dam's breed, sire's name and dam's name (if any), the register type (Birth), the date of registration (date of birth), origin (name of the flock), weight (if any) and the type of birth (single) will be automatically filled. Click 'Assign Breed', if both parents are known, or select the breed, if only the mother is known. Select the flock subdivision where the animal is, enter additional available information and click 'Submit'. In the case of multiple lambs/kids, sex and weight will have to be provided manually as the system has no way of knowing which lamb/kid will be entered first.

After completing this form to lamb/kid, confirm and the system returns to the lambing/kidding form. If more than one lamb/kid exists, enter their number in the appropriate fields (Lamb/Kid 2), the lamb/kid form will automatically open again for inclusion.

Lambing/kidding records must be entered in chronological order as the system will not allow the insertion of records at earlier dates than the last occurrence.

5.3.2. Productives

5.3.2.1. Weights

Individual weight measurements for animals at different stages of production (birth, growth, weaning, post-weaning, adult weight, slaughter weight etc) are entered in this window.

Enter the animal code or select the animal by clicking the 'Search' button. Searches may be made based on code, tag, name or register. Select the type of search, enter information in the field provided and exit using the TAB key. Click 'Submit' once the animal has been located. Note that the code of the animal will be sent to the weight registration window.

Enter the measurement date, select the type of weighing and the management correspondent to this animal. Enter the weight in kg and body condition (score of 1-5). Select the suckling type, i.e., how the animals are being raised in the pre-weaning, whether natural or artificial. The Observations field

may be used to record any information deemed important at the time of the measurement.

The types of weighing available are birth weight, pre-weaning weight, weaning weight, post-weaning (up to 330 days) weight, a year-old (330-395 days old), adult (after 395), slaughter or sale weight and weight of the dam at weaning of its lambs/kids. Birth weight is usually informed at registration of the animal through the lambing/kidding record. Use this screen to inform this weight only when the animal has already been registered and for some reason the birth weight was not informed. This can occur, for example, when registering adult animals with known birth weight values. The weaning weight of the animal and the dam's weight at weaning should be registered preferably in Menu - Productive - Weaning Register, which we will discuss later. However, in some situations it may be registered here. Attention must be paid to register the weight once the animal reaches one year of age as it is really necessary to know if the animal is between 330 and 395 days of age. When registering a slaughter or sale weight, the animal will be automatically culled from the flock and will be sent to the inactive list.

5.3.2.2. Visual/Morphometric

This window allows you to add visual evaluations, scrotal circumference and height of the animal. Enter the animal code or select the animal by clicking the 'Search' button. In this case a pop-

up window will open to locate the animal by code, tag, name or register. Select the search type, enter the desired information and exit the field using the TAB key. After the system locates and selects the animal, click 'Submit'.

The measurements window may be used to enter and confirm measurement dates and the management that the animals are under. The Observations field may be used to record any information deemed important at the time of measurement.

The height and scrotal circumference measurements will be available for all types of flocks. Visual assessments are available for meat flocks. The frame/conformation is the presence of muscle mass and the total estimated carcass meat with strong aspects of physical structure (including good legs) and good size (score 1-6). The precocity finishing is assessed by the ability or degree of early deposition of fat (Score 1-6). Generally, a long and tall animal was finished later than a heavysset animal. Muscularity is the development of muscle mass observed on the forearm, leg, shoulder, loin, rump, and the width and depth of hindquarters (Score 1-6). Measurements by ultrasound for fat thickness and loin eye area may also be entered.

These measurements will also be available in dairy or dual purpose flocks. In addition, visual evaluation parameters of dairy animals according to the American Dairy Goats Association (ADGA) are also available. This system uses four categories: general appearance, dairy character, body capacity and udder (except for males). The values to be used for these evaluations are as follows:

Excellent - 90 or more points

Very Good - 85-89 points

Good - 80-84 points

Acceptable - 70 to 79 points

Insufficient - 60 to 69 points

Poor - 59 points or less

5.3.2.3. Weaning Register

Here the weights should be recorded for dams and their offspring at the time of weaning.

Enter the weaning date and select whether the ewe/doe is the dam of the lambs/kids or is an adoptive dam. This is important because the maternal ability can be attributed to the animal that actually raised the lambs/kids. In some flocks, some dams reject their young and these are raised by other females, who gave birth at the same time. Therefore, it is important to record this type of occurrence on the Menu Events - Animals Adoption.

Enter the ewe/doe code (legitimate or adoptive dam), its weight and body condition (score 1-5), and select the management that she was subjected to during the pre-weaning period. Then enter the code and weight of the offspring of this ewe/doe, and select the suckling type (natural or artificial) which they were submitted to and the management. Click on 'Submit' to save the information.

Attention! Legitimate and adoptive offspring must be registered separately. Register the legitimate offspring first and then the adoptive offspring, entering the weight and body condition of the ewe/doe only once.

5.3.2.4. Milking Recording

Milk control information may be registered here. This option is only available for dairy or dual purpose flocks. Select the type of control: official, if performed by accredited supervisors of the association, or if it was done by the producer.

Enter or select the female by the button 'Search'. Searches may be done by code, tag, name or register. When selecting the type of search, enter information in the field provided and exit using the TAB key. Click "Submit" once the desired animal has been located.

The system will only allow registration of females who are already enrolled in lactating categories (Female Lactating Open, Female Lactating Mated and Female Lactating Pregnant). If you enter an nonexistent code or animal that is not in these categories, the system will not accept the registration information. If the code of the animal exists and but is in a different category, then its category must be changed in the Menu Flock - Animals - Internal Animal (edit) in order to record the information.

Enter the date of the occurrence. Enter the weighing of the milk each time milkings are performed on the property. If it is performed once use only the field Milk-Milking 1 and so forth.

Please state whether there was milk collection for quality analysis by marking 'yes' or 'no'. If so, enter the sample code. If possible please provide the body condition score of the ewe/doe. This information is not mandatory, but very important to control the animal.

Select suckling type (natural or artificial), the milking type (manual or mechanical) and management that the ewe/doe is subject to (standard management systems provided by the software or those registered in the Menu Register - Management Systems).

Select a disease code if the animal is suffering from an illness at the time of control . The Observations field may be used to record any information deemed important at the time. Click "Submit" to record the information.

Dairy control must be recorded in chronological order as the system will not allow registration of events prior to the last registered one.

5.3.2.5. Milk Content

Milk composition analysis may be recorded here and is available only for dairy or dual purpose flocks.

Enter or select the female by clicking the 'Search' button. A pop-up window will open and the search may be done based on code, tag, name or register. Select the type of search, enter information in the field provided and exit using the TAB key. Click

"Submit" once the system has located the desired animal. The system will only allow the registration of females already enrolled in lactating categories (Female Lactating Open, Female Lactating Mated and Female Lactating Pregnant). If you enter a nonexistent code or animal that is not in these categories, the system will prevent the registration of information. If the code of the animal exists but is in a different category change its category in Menu Flock - Animals - Internal Animal (edit) in order to record the information. The system will not allow information registration associated with lactations that were closed by Menu Events - Productives - Lactation End.

Enter the date when milk was collected for analysis. Enter the sample code that was sent to the laboratory. Enter percentage of fat, protein, lactose and total solids (type in percentage 3.2%, instead of 0.032) and somatic cell counts (SCC x1000 cells/ml) for this sample. At least one of the constituents must have been analyzed, preferably fat. Records should be inserted in chronological order to avoid errors in total production calculations.

5.3.3.6. Lactation End

Information for drying females who are in lactation should be recorded here. This window is available only in dairy or dual purpose flocks.

Enter or select the female by clicking the 'Search' button. A pop-up window will open and the search may be done based on

code, tag, name or registration. Select the search type enter information in the provided field and exit using the TAB key. Click "Submit" once the system finds the desired animal'. The system will only allow registration of females who are already enrolled in lactating categories (Female Lactating Open, Female Lactating Mated and Female Lactating Pregnant). If you enter a nonexistent code or animal that is not in this category, the system will prevent information registration. If the code of the animal exists but is in a different category change its category in Menu Flock - Animals - Internal Animal (edit) in order to record information.

Enter the lactation end date and select the reason for drying.

5.3.3. Animals Adoption

When offspring is rejected by their dams and are adopted by another ewe/doe the occurrence may be registered here. This is important because the maternal ability can be attributed to the animal that actually raised the offspring.

Enter the lamb/kid code and the adoptive ewe/doe code. Repeat the procedure if this same ewe/doe adopted more than one lamb/kid.

5.3.4. Managing Animals

The purpose of this window is to allow registration of transfers, transportation of animals between pastures or flock

subdivisions, and communicate culling, deaths, etc., while keeping identification, production and reproduction data.

There are two types of managing: internal and external. Internal managing occurs within the farm itself and involves changes between pastures and / or flock subdivisions. External managing refers to animals leaving the farm by slaughter, culling, death, etc. In this type of movement data relating to the animal will be stored in the inactive archive.

Select animals will be moved from the table to your left. Click 'Add Animal' to move the animals to the table to your right. A specific animal may be searched by code, tag, name or register. Enter the information into the search field and exit using the TAB key. If the animal exists it will be selected in the left frame.

Animals may be selected as groups by date and type of occurrence. Enter the date and select the type of occurrence. If culling is selected then a reason must also be chosen. Changes in subdivision or pasture must be selected in the fields below.

Be careful to know exactly the flock subdivision and pasture the animal is in because all flock subdivisions and pastures are registered. Note that in the options for selection of pasture, it is informed in that flock subdivision that pasture is.

Attention! Only use this tool when selling or slaughtering animals without weight values at the time of the event. If you have the weight values when selling or slaughtering, use Menu - Events - Productives - Weights by selecting the corresponding type of weighing.

5.3.5. Reversal of Events

This is where typing errors and known mistakes may be corrected. Take care when using this feature in order to avoid inconsistencies in the data. The improper reversal of an occurrence can cause serious problems in the databank.

In this screen there are eight reversal options: 1.) Only mating; 2.) Pregnancy diagnosis; 3.) Mating, lambing/kidding, lactation and associated offspring; 4.) Dairy control; 5.) Lambing/Kidding, lactation and associated offspring; 6 .) Weights; 7.) End of lactation; and 8.) Lambing/Kidding and lactation associated.

The first option is used to correct errors in mating before typing the corresponding lambing/kidding. To reverse a mistaken pregnancy diagnosis, use the second option. When lambing/kidding and offspring data regarding this mating have already been registered, you should use the third option. In this case, the open lactation and the dairy controls will also be deleted. Option 8 must be used to correct typing errors in lambing/kidding. If there is associated offspring for this lambing/kidding then you should use the option 5 to remove it along with the lambs/kids that were included. Option 6 relates to the reversal of mistakes in weight measurements and weighting dates. Option 4 will delete the last dairy control and will fetch the last available dairy control data and place it in this

position. Option 7 will correct lactation periods that were closed by mistake. Options related to lactation will be disabled in meat flocks.

This tool only allows the reversal of the last occurrence. If you have already entered a weight, mating or lambing/kidding posterior to the occurrence you want to reverse, the system cannot proceed with the reversal, unless the user reverses each occurrence one by one, until you reach the one you want. Be aware that this is quite risky and may cause inconsistencies in the data, in addition to increasing the work to retype any information.

To proceed, make sure you want to reverse. Select the animal that has the occurrence you want to reverse. You can search it by code, tag, name or register. Enter the information in the search field and exit using the TAB key. Select the type of occurrence. By clicking 'Submit', a message appears with the last occurrence of this animal (if any). If you want to reverse that, click 'Reverse'.

5.3.6. Transfer Between Flocks

The animal transfer process between flocks consists of two steps. In the first, the user of the original flock informs the animals to be transferred, transfer date and the receptor flock the animals will be sent to in Menu Events - Transfer Between Flocks - Transfer. By performing this procedure,

data records of those animals will be available for transfer to the receptor flock. In the second step, the user of the receptor flock should accept the transfer in the Menu Events - Transfer Between Flocks - Accept / Reject Transfer. This two-step procedure prevents errors and allows interaction, knowledge and consent between the users of the flocks involved.

5.3.6.1. Transfer

To transfer animals select them in the list to the left and click 'Add Animal' and they will be moved to the list to the right. Searches may be done by code, tag, name or registration. Enter the information in the search field and exit using the TAB key. The system will locate the animal if it exists. Enter the transfer date, select the receptor flock and click 'Submit'.

It is noteworthy that all data related to transferred animals will be available only to the donor flock. The flock that receive the animals will not have access to this information. Likewise, events in the receptor flock beginning at the transfer date, will not be available to the flock of origin.

5.3.6.2. Accept/Reject Transfer

In this screen the animals indicated by the flock of origin will be available for transfer. The transfer procedure may be accepted or rejected by the users of the flocks involved. Select

the animals in the list and click 'Accept' or 'Reject'. The 'Accept' button will be disabled for the flock of origin.

5.4. Health

This system features a freeform for input of health related information, since it serves distinct regions and production systems and it would be difficult to meet the required criteria for the various environments and systems. In this manner, every user can register the most common sanitary practices in your area.

5.4.1. Registration of Products

Here you must register sanitary control products, such as examinations, vaccinations, medications, preventive practices, etc. First select the type of product and if it is not listed, select 'Other' and type the information in the available field.

In the case of preventive practices, such as use of footbaths, hoof trimming, etc., enter the name of the practice in the appropriate field and then record the name of the product and its active principle used in the practice.

For examinations, register its name in the field 'Trade Name' and inform its type of result whether it is numeric or positive/negative. For vaccines, register its name and its type (what kind of disease) in the corresponding fields. For others, record

trade name and active principle. Click "Submit" to save the information.

5.4.2. Collective Events

Use this window only for collective procedures such as vaccinations, deworming and tests whose products, doses and results are the same for each group of animals selected. For tests such as fecal egg count (FEC), which have different results for each animal, use the individual occurrences window as discussed below.

Select the animals in the list to the left and add them to the list to the right by clicking 'Add Animal'. If you added some animal by mistake, click on it, and click the 'Remove Animal'. If you want to search some animal, select the type of search you want (by code, tag, name or register), enter the information indicated in the field and leave it with the TAB key.

Enter the date of the procedure and then select the type and the name of the product used. In case of exams, indicate the result (positive or negative). For other procedures, indicate the dose. Finally, click the 'Submit' button.

5.4.3. Individual Events

Individual sanitary occurrences for each animal may be registered in this section. Select or enter the animal code, enter the date of occurrence and select its type.

If the occurrence is a disease, select it in the 'Disease' field and report in the 'Exam' field the test performed for diagnosis. If treatment was performed, select in the 'Trade name' field the products used and report in the 'Treatment/Dosage' field the details of the treatment, stating dosage, number and date of applications, and so on. If no treatment was performed then take no action and the system will automatically inform that there was no treatment in Treatment / Dose field.

In the case of drugs such as antibiotics, NSAIDs, anthelmintics and others products, or vaccines or other preventive practices, just select the product used in field 'Trade Name' and enter in detail the treatment.

For examinations, select the test performed in the 'Trade name' field and enter the result in the appropriate field. It is noteworthy that the information for results may be either positive or negative or numeric values as in the case of EPG, Famacha, etc..

The observation field is optional and may be used to record information deemed important.

5.4.4. Animals in Treatment

Every animal diagnosed and reported as ill should have this information finished. Thus, this screen will display the animals which are under some kind of treatment.

In the table, select the animal you want to report the situation of illness and after that click 'Select'. A table with information on the treatment given to the animal will appear.

Enter the date and outcome of treatment and click 'Submit'. The possible results are Cured, Cured with Sequel, Death, Sacrifice and Treatment Inefficient. In cases of Death and Sacrifice, the animal will be automatically discarded, with all its information sent to the inactive archive. In the case of animals cured with sequel, the option to discard will be available to the farmer and will not be done automatically. For inefficient treatments, report the reasons in the 'Observation' field and register a new treatment if desired.

5.5. History

5.5.1. Reproductive/Lactations

This window will display reproductive and lactation history (for dairy and dual purpose flocks) for the females in the breeding flock. All matings, lambing/kidding and lactations ever registered for the females of the flock can be checked. Some editing of previously registered data is also possible.

To search for an animal, select the search type, whether by code, tag, name or register, enter the information in the corresponding field and exit the field using the TAB key. Select whether to view matings, lambing/kidding or lactation for the

selected animal and click with the mouse on its code.

For 'Matings', a window will open containing information about the animal, some statistics (mean value for the animal and its difference from the average of the flock) and a list of the recorded matings for the animal. If you wish to rewrite any information regarding any specific mating, click with the mouse on it. This opens a new window with the information of the selected mating. Attention should be paid to this procedure to avoid serious errors. The animal code is not available for modification. The information already presented in item '5.3.1.2. Matings' applies here too.

Likewise, if you select 'Lambing/Kidding', a window will open with information about all lambing/kidding regarding the selected animal. The statistics presented refer to the average weight at lambing/kidding, litter weight at birth and at weaning, age at first lambing/kidding, lambing/kidding interval, average gestation length and days to lambing/kidding (range of days between the beginning of the breeding season and lambing/kidding). The differences between the means of the animal and the flock as a whole are also presented. To rewrite any lambing/kidding information click on it. Attention must be paid to this procedure in order to avoid serious errors. The animal code is not available for modification. Follow what was already stated in item '5.3.1.4. Lambing/Kidding'.

For 'Lactation' in case of dairy and/or dual purpose flocks, a window will open listing recorded lactations and associated information. Statistics regarding lactations, such as average milk yield and daily yield, average duration of lactation, etc. will be

presented. Lactations data may not be edited. However, when clicking on a particular lactation, a new window will open listing all dairy control information recorded for this lactation. Likewise, the dairy controls cannot be edited.

5.5.2. Weights

This window displays the historical production data for all animals in different categories. All measurements recorded may be verified. Some corrections on data may also be made. To search for an animal, select the type of search, whether by code, tag, name or register, enter the information in the corresponding field and exit the field using the TAB key. Click on any given animal to check its associated information. This opens a new window with information about the animal, statistics on its performance relative to the flock and all weighting data available.

To edit weight values click just click on it. This opens a window with the recorded information. Attention should be paid to this procedure to avoid serious errors. The code of the animal is not available for modification. Information about weighting records were given in item '5.3.2.1. Weights '.

5.5.3. EPD

This window displays the history of Expected Progeny Differences (EPD) / Predicted Transmission Ability (PTA) of the

animals of the flock, relative to the last genetic evaluation. To search for an animal, select the type of search, whether by code, tag, name or register, enter the information in the corresponding field and exit the field using the TAB key. Click on the selected animal and a window will open displaying general information about the animal and all EPDs that have been estimated for him. If the animal has not participated in the last genetic evaluation or if the flock has not had any genetic evaluation, there is no EPD and the screen is blank.

5.5.4. Health

This window displays health history of all animals in the flock. To search for an animal, enter its code in the field next to 'Search for Internal Animal' and exit the field using the TAB key. Click on the desired animal to check information associated with it. If the animal has no health information recorded in the system, the window will be empty

5.6. Reports

5.6.1. List

5.6.1.1. Flock Subdivisions

Clicking this Menu link will generate a report with all flocks subdivisions registered in the system. These are ordered by code

and also show your name, area and registration date.

5.6.1.2. Pasture

Likewise, this link generates a report of all registered pastures containing code, name, area, topography, water supply, pasture type and date of registration.

5.6.2. Animal

This Menu section reports information about all registered animals.

5.6.2.1. Flock

5.6.2.1.1. Current Flock

If you want to generate a list of active animals in the flock use this link. A pop-up window will open containing a selection filter. Animals may be filtered by sex, category, type of birth, genetic group, flock subdivision, pasture, offspring of certain sire or dam. Select the desired information and click 'Submit'. If you want all animals just click "Submit". The report will be generated based on the selected filter and will contain a list of active animals, codes, tags, registers, names, breeds, dates of birth, sires, dams, sex, categories, flock subdivisions and pastures.

5.6.2.1.2. Inactive Animals

Same as above, this link generates a list of inactive animals (culled or dead) from the flock which may be filtered by culling type. The information listed in the report includes codes, tags, registers, names, breeds, dates of birth, sires, dams, sex, categories, types and dates of culling.

5.6.2.1.3. Flock History

This link is a combination of the previous two, because it generates a list of all the animals already registered in the system: active and inactive. It also uses the same type of filter and presents the information in the same manner as previously described.

5.6.2.1.4. External Animals

Displays a list of all external animals registered in the system including codes, registers, names, breeds, dates of birth, sires, dams, sex and categories.

5.6.2.1.5. Semen

Reports information about semen of registered animals including codes, registers, names, breeds, dates of birth, sires and dams.

5.6.2.2. Individual Form

If you want a report with all the information recorded for a particular animal, this is the option. To search for an animal, select the type of search, whether by code, tag, name or register, enter the information in the field corresponding and exit the field using the TAB key. Clicking on the selected animal and a window containing the report will open. This report presents the data sheet with general information about the animal, its pedigree, reproductive, lactation, weighing, visual evaluations and DEPs history. It is an excellent way to view the entire life of the animal in the flock and may be passed on to potential buyers at the time of sale.

5.6.2.3. Flock Inventory

This report presents the current amount of animals organized by sex and categories registered in the flock.

5.6.3. Breeding Season

If the flock uses and records breeding seasons, this link displays a full report of any given season, with information on lambing/kidding rate, fertility, averages of weight at mating and lambing/kidding, prolificacy, average weight of lambs/kids, number of lambs/kids born, etc. Just click on the desired breeding season and a new window will open displaying the report.

5.6.4. Events by Date

Here you can make a list of all occurrences (registered animals, weighing, matings, lambing/kidding, dairy control etc.) in a certain time period. Enter the starting and ending dates of the desired interval.

5.6.5. Data Entry by Date

Here you can make a list of occurrences within a desired time period of entry in the system. Enter the starting and ending dates of the desired interval.

5.6.6. Health

5.6.6.1. Disease

This report will present the list of diseases that occurred and were registered in the flock, the number of their occurrence, prevalence and mortality.

5.6.6.2. Exam

In this report, exams performed and recorded in the herd will be presented separately according to their result type. For tests with numerical results the report will contain the exam date, the number and percentage of animals evaluated and the average

value of the results. For positive / negative test results the same information will be reported in addition to the number of positives and negatives..

5.6.6.3. Vaccine

This report presents the vaccinations performed and recorded in the herd, dates of occurrence, number and percentage of vaccinated animals.

5.6.6.4. Individual

This Menu item generates a complete health report for a given animal. To search for the animal, select the search type, whether by code, tag, name or register, enter the information in the field beside and exit the field using the TAB key. Click on the selected animal and a new window will open displaying information about the animal, including its pedigree, and reports of examinations, vaccinations, illnesses and other health related occurrences, as well as health information from its father and mother.

5.6.7. Management

For dairy or dual purpose flocks, these reports are available to aid management.

5.6.7.1. Milk Recording

Clicking this link will open a popup window with a list of all registered dairy controls and their dates. Click on the date of the desired control and then 'Submit' and the report is generated with information about this control. The report identifies the owner of the flock and lists the animals that participated in this dairy control with information on breed, code, name, date of birth, age, date of lambing/kidding, order of lactation, days in milking, control number, the amount of milk produced, persistency of lactation (%), fat content, protein content, lactose content and total solids content, somatic cell count and the amount of accumulated milk. The report also presents an overview of milk control, with a few means, and a list of females who completed lactation in the prior control.

5.6.7.2. Reproductive/Lactations

Clicking this link will open a popup window with a list of all registered dairy controls and their dates. Click on the desired date and then "Submit" and the report is generated with reproductive information from the females at the time of this control. The report contains data from the flock and the list of females and associated information including code, name, breed, date of lambing/kidding, age, order of lactation, days in milk, date of the first service, date of last lambing/kidding, number of services per conception, projected lambing/kidding interval, days open, days of gestation, date of the

next lambing/kidding, date of drying and dry days.

5.7. Bookmarks Collection

This part of the menu generates forms for field data collection.

5.7.1. Initial Register

Displays a blank form to be used for initial registration of animals before registering them in the system. The form contains fields for code, tag, register, name, breed, sire, dam, birth date, sex, category, record type, weight, type of birth and coat.

5.7.2. Events Register

Generates a blank sheet to be used for recording various events in the field such as sale, slaughter, death, culling, changes of flock subdivision and / or pastures, breeding seasons, diseases, disappearances, changes of tags, etc.

5.7.3. Matings

This link generates a list of animals available for mating. It will open a window where you can filter and select females based on the following criteria:: minimum age in days - selects those

females with the minimum age required (e.g., at least 300 day old females); minimum weight in kg - select females that will be mated by weight (e.g., females over 35 kg). Both parameters may be concurrently used (e.g., select all females that are at least 300 days of age and over 35 kg). Leave these fields blank if you want to select all animals available.

Attention! The correct operation of these filters depends on the quality of entered data. The filters cannot operate if data is not available.

Click "Submit" and a form with the list of females available for mating will be generated containing codes, tags, ages, dates of last lambing/kidding, dates of last weighing, last weight. Information must also be provided in the blank fields for date, ram/buck at mating (sire), weight, body condition, mating type, type of estrus and management.

5.7.4. Control of Embryo Transfer

Generates a form to be filled with data from embryo transfers: code and tag of receiving female, date, code of the ram/buck, code of the donor, body condition and weight of the receptor female, type of estrus and management.

5.7.5. Diagnosis of Pregnancy

Generates a file with a list of animals waiting for pregnancy diagnosis. Contains information such as animal code, mating date, ram/buck (sire), date of last lambing/kidding, days of gestation, last order of lambing/kidding, sex of the last offspring. Results and observations fields are blank and must be filled.

5.7.6. Lambing/Kidding

Generates a form with the list of animals diagnosed as pregnant and are awaiting the lambing/kidding record. Contains code, tag, expected date of lambing/kidding, the ram/buck code, and input fields: date, weight, body condition, type of birth, lambs/kids codes (1-4), sex of the offspring (1-4), weight the offspring (1 to 4) and management.

5.7.7. Weights

Filters may be used to select desired animals and generate this form. Clicking this link will open a window with filters similar to what was described in item '5.5.2.1.1. Current Flock'. Choose the desired parameters or leave them blank to select all animals and click 'Submit'. A form will be generated containing the following information: code, tag, dates and respective weights of the first and last weighing, average daily weight gain, accumulated weight gain,

age and category. Blank fields for input are: date, weight, type of weighing, body condition and management.

5.7.8. Milk Recording

Generates a form containing all lactating females and associated information such as code, date of lactation onset, lactation days, date of the last dairy control, control order, total milk yield and tag. Blank fields for input are: total milk in first, second and third milking (if any), sample for analysis (if any), body condition, type of suckling and milking type, management and disease code (if any).

5.7.9. Visual/Morphometric

Generates a form with animals selected for visual evaluations. Similar to that reported for item '5.6.7. Weights', also uses a filter window, as detailed above. By clicking 'Submit', the form comes with information of code, tag, age and category. Blank fields for input are: date, height, scrotal circumference, management and visual scores that will differ between meat, dairy or dual purpose flocks.

5.7.10. Weaning Register

Displays the sheet with the list of animals waiting to register weaning. Contains code and tag of dam, code and tag of lambs/kids, date of birth, age and birth weight. Blank input fields are: weaning date, weight and body condition of the dam, weight of lambs/kids and managements for dam and offspring.

5.8. Tools

5.8.1. Generate Text Files

This link allows you to generate text files (like '.txt') to be saved on the user's computer. These files are useful to perform statistical and genetics analysis, among other purposes.

5.8.1.1. Pedigree

Generates a text file containing information from the flock pedigree. It also contains animal codes, sire and dam codes, and date of birth, breed, etc.

5.8.1.2. Pedigree Recoded

Generates a text file with the pedigree recoded. Besides the original codes of animal, sire and dam, contains new numerical

codes, in chronological order of age (parents with codes higher than those offspring).

5.8.1.3. Weights

Generates a text file with all weightings made in the flock. Contains the general information of animals, such as code, breed, date of birth, type of birth, sex, dam, etc., and the weights with their respective types.

5.8.1.4. Visual/Morphometric

Generates a text file with all the visual and morphometric evaluations performed in the flock. Contains the general information of animals, such as code, breed, date of birth, type of birth, sex, dam, etc., and measurements performed. These will differ depending on the purpose of the flock (meat, dairy or dual purpose).

5.8.1.5. Reproductive/Lactations

Generates a text file with all reproductive occurrences and lactations measured in the flock. Contains the general information of animals, such as code, breed, date of birth, type of birth, date of lambing/kidding, type of lambing/kidding, sire, sex of offspring, etc..

5.8.1.6. Milk Recording

Generates a text file with all dairy controls performed in the flock. Contains the general information of animals, such as code, breed, date of birth, type of birth, sex, mother, etc., and controls with quantities of milk and quality analysis (if any).

5.8.2. Insert EPD's

This tool allows you to include in the system, breeding values (EPDs) after performing genetic evaluations. These should be available in a text file prepared as follows: all the data from each animal must be separated by line, i.e., one animal per row, columns of data are delimited by semicolons (;), the first column must contain the animal code; if there is any total genetic merit index this should be placed in the last column of each row, each EPD must be followed by its accuracy.

Once the file is ready, you must indicate in the system whether there is or not total genetic merit index. In the table on the left select the traits for which EPDs are present in the text file. Select one by one in the same order they are in the file. When selecting, click 'Add Trait' for it to be sent to the table to your right. If you want to remove a feature click 'Remove Trait'. On the bottom of the window there is a list with the initials of the traits available for EPD insertion. It is very important to select the exact order of the traits as they are in the file thus avoiding mistakes when the genetic values are

imported. Enter the reference year of the genetic evaluation and click 'Submit'.

If you performed genetic evaluation for some trait that is not in the list, contact your system administrator for help with inserting new traits in the database.

5.8.3. Selection by TGM – Total Genetic Merit

For flocks that have performed genetic evaluations, this tool can sort the animals by their genetic merit, assisting the breeder in choosing their best animals.

For this, the user can construct a selection index with how many traits he wants. The selection index allows the choice of animals that meet several aspects. For example, for meat flocks, if the breeder wants an animal that has good reproductive ability, good growth and good maternal ability, he must build an index that includes the three mentioned aspects. So he could choose lambing/kidding interval (group 1 - reproduction); slaughter weight, pre-weaning weight gain and post-weaning weight gain (group 2 - growth) and litter weight at weaning (group 3 - maternal ability). For dual purpose flocks, if he wants an animal that has good reproductive ability, good growth rate, good maternal ability (for cases in which the lambs/kids are naturally raised with their dams) and good milk production, he must build an index based on these four aspects. So the parameters chosen could be lambing/kidding interval (group 1 - reproduction); slaughter weight, pre-weaning

weight gain and post-weaning weight gain (group 2 - growth), litter weight weaning (group 3 - maternal ability) and milk yield (group 4 - milk production). The order of animals for a single trait may be constructed by simply selecting the desired trait. It is noteworthy that the amount of possible indexes is very large and the above mentioned cases are just examples.

The table to the left only displays traits with EPD estimates available for your flock. To construct the index, select the traits in the table to the left and click 'Add Trait' so it is moved to the table to the right. To remove a trait, select it and click 'Remove Trait'. Once traits are selected, click 'Building Index'.

In constructing the index, there will be fields for typing values according to the number of desired traits. Select the value type such as economic values or percentages. The first case should be used when you know the amount of monetary profit achieved for each unit gain for the trait under selection. These are expressed in currency per trait unit (e.g., \$/kg for weaning weight). These values may be negative or positive depending on whether they promote profit increase or decrease while the trait increases. When there is no such economic values a percentage value should be used. In this case, for each trait considered in the index, enter an integer from 1 to 100, positive or negative. If you want to reduce a trait, use a negative value, e.g., reduce the age at first lambing/kidding. The sum of these percentages should be equal to 100. The higher the value, the greater the importance of the trait in the index. If you use an index, for example, with IEP_DEP (EPD for lambing/kidding

interval), PA_DEP (EPD to slaughter weight), GPRE_DEP (EPD for pre-weaning weight gain), GPOS_DEP (EPD for post-weaning weight gain) and PTCN_DEP (EPD for litter weight at birth), you could use the following percentages: -30, 30, 15, 15, 10, respectively.

If you choose only one trait, use 100 or -100. Select the sex of the group to be selected, the category, the flock (active, inactive or all animals), the genetic group and procedure. The last one is depends on the desired goal: to select or cull. Based on this selection, the animals will be sorted in ascending or descending order. For example, if you want to cull the worst animals, choose culling, and the animals will be ordered from worst to best.

Determine the percentage to be selected or culled. For example, type 10 if you want to select the top 10%. Finally click the "Submit" button. If you want to know the position of a specific animal in the list enter its code in the provided field.

A window will open and list the animals according to the index, the cutoff percentage and desired order (selection or culling).

5.8.4. Inbreeding

This tool displays a report about inbreeding within the flock. The screen will display the number of inbred animals, the mean inbreeding coefficient of inbred animals and the mean inbreeding coefficient for the flock. Furthermore, a list with all inbred animals is presented, containing information from their parentals.

5.8.5. Matings

This tool allows the selection of matings that will maximize the genetic gain on the flock and avoid increasing the average inbreeding within the flock. You can choose whether to construct separated selection indexes for ewes/does and rams/bucks. This is important, because in some cases you may want to use different parameters to select sires and dams.

To do this, select whether sires and dams will be considered in the evaluation. To make this selection, hold down the CTRL key on your keyboard, and proceed with the selection of each sire and each dam available by clicking on each animal. It is allowed to select a maximum of 100 sires and a maximum of 1000 ewes/does. The maximum proportion of dam by sire is 100. Sires are to the left and dams in the table to the right.

Build the selection index that will be used in the evaluation. Proceed as previously described for selection for total genetic merit, item '5.7.3. Selection by TGM'. In case the indexes differ for sires and dams the process must be done for each separate group.

Indicate the average maximum value for inbreeding as a percentage (e.g., 3%, 6%, 10%, etc.). This value will depend on the current situation of the flock. See tool inbreeding, item '5.7.4. Inbreeding', to know the average inbreeding within your flock. Smaller values are recommended for flocks that already present high inbreeding values, thus increasing the control of this aspect.

Also indicate the maximum inbreeding value for a given mating. Enter this value as percentage (e.g., 3%, 6%, 10%, etc.), usually greater than the average value determined above. This value is important to control certain matings, such as between sire and daughter. For example, if you do not want mating between sire and daughter, or between sire and granddaughter, use 50% and 25%, respectively.

Click 'Submit' to display a list with the favorable combinations of sires and dams to be mated.

5.9. Help

This link shows a summarized report to aid in the management system utilization.

5.10. About System

Clicking this link will open a pop-up window displaying information about the version and copyright of the management system.

5.11. Exit

Click this link to log out of the system and close the connection with the database.

6. Important Clues

1 - Standardize the font in data entry, for example, only uppercase.

2 - Standardize the entering of tags, i.e., if zero is used at the beginning of tag, always use it with other animals, e.g., 0350, instead of 350.

3 - Use the TAB key to move from one field to another while entering data.

4 - Use ENTER to submit entered data.

5 - When you receive a field form and two animals have the same tag (code not available) look for information that may distinguish them such as sex, birth date, identification of parents, etc.

6 - When searching for an animal in flock reports (Menu Reports - Animal - Flock), use CTRL + F. A field in your browser, at the bottom left, will appear to run searches in the active window.

7 - When you try to type a mating and the female is not found, check on the registration form which category the animal is in. Animals are only available for mating after being weaned. If you are sure that these data were not measured, you can change the category in the registration form from 'Lamb/Kid' to 'Weaner'. The same can be done for males that are not available as sire.

8 - It is possible that an ewe/doe went through mating and the lambing/kidding has not been confirmed, thus she will not be available for a new mating until the lambing/kidding is confirmed. In

this case, you should verify that in fact there was no lambing/kidding for this mating. If it did not occur, a negative pregnancy diagnosis must be registered one or two months after the mating date.

9 - Use filters to facilitate searches in reports.

10 - When you enter the lambing/kidding and verify the occurrence of gestation periods longer or shorter than those allowed by the system, check whether errors occurred when the information was collected or typed. If there is no error in the annotation, the animal may have had abortion or stillbirths.

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