Systems of cattle identification and recording: the Chilean experience

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General background

Brief geographical description

Continental Chile, located along the extreme south-west of America, displays some extraordinary geographic features: it is a narrow strip of land, more than 4 200 kilometres long with a maximum width of 375 kilometres and minimum of 90 kilometres, flanked on both sides by two large mountain ranges; the Andes Mountains and the Coastal Range. In between these two mountain ranges lies the Intermediate Depression. Despite the fact that there are some regional differences, these physical features are present until they gradually vanish in the southern sea.
To the east, the high Andean peaks (reaching 7 000 m above sea level) form a natural border with Argentina and Bolivia. To the west lies the Coastal Range with northern heights of a maximum of only 3 000 m above sea level, which gradually decreases towards the south. In the regions known as Norte Chico (Little North), and Central (Central Zone), there are the transverse valleys. These valleys sweep down from the eastern Andes to the western Coastal Range. These peculiarities make flat land scarce in relation to the total land surface area: some 20% of a total of 756 000 km^2.

Arable land

Out of approximately 75.6 million hectares of continental Chile only one third has some agriculture and forestry potential. This area is divided in the following way:

- 8.5 million hectares : livestock breeding potential
- 11.6 million hectares : forestry potential
- 5.1 million hectares : arable land
- (1.8 irrigated and 1.3 potentially irrigable; 2.0 of dryland).

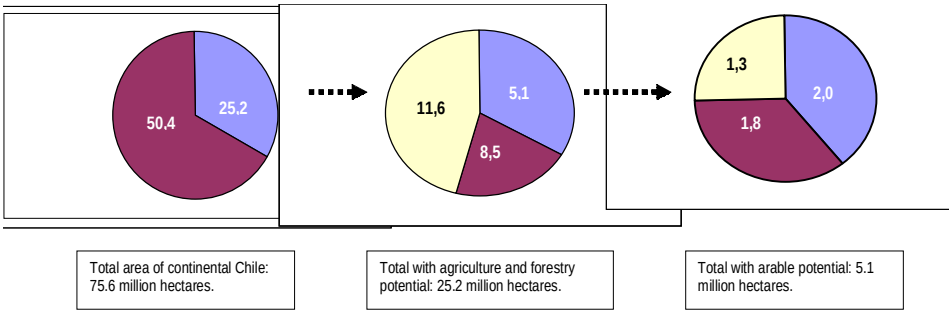


Figure 1. Arable land distribution in Chile.

The Chilean bovine population

There are four million heads of cattle in Chile, most of which are in the southern regions, specifically the eighth ninth and tenth regions, as you can see in Table 1.

In effect, as the table demonstrates, 71% of the entire cow population is amassed in three regions, in which the tenth alone holds 40%.

The predominant productive system is extensive dual-purpose, in other words, farms that produce both beef and milk, which are intimately related to the eco-system that sustains them.

Last but no least, it is important to mention that a large proportion of Chile's cattle are in the hands of small-scale agriculturists (over 40%), as reported in Table 2.

Table 1. Heads of cattle per region, according to the 1997 Livestock Census.

Region	Nº Heads	% per Region
I	4 618	0.1%
II	524	0.0%
III	6 606	0.2%
IV	38 792	0.9%
V	131 671	3.2%
RM	164 014	4.0%
VI	155 997	3.8%
VII	367 447	9.0%
VIII	550 432	13.4%
IX	784 336	19.1%
X	1 587 557	38.7%
XI	168 770	4.1%
XII	137 674	3.4%
Total cow population	4 098 438	100%

Table 2. Cattle distribution among producer types.

Producer Type	All Cows	Dairy Cows
Large scale	38.01%	37.63%
Medium scale	18.81%	19.58%
Small scale	37.50%	39.61%
Familial subsistence	4.88%	2.78%
No Purpose	0.01%	0.00%
Unclassified	0.79%	0.39%

Chile's present situation in identification and registry

At the present moment, Chile is without a nationalized system of identification. There exist only two ventures in this area, the first by existing programs of dairy control (there are three active programs in Chile). These are in the hands of private companies that lend a service to dairy farms, who, as a condition, must have their herds correctly identified. This information is only available to those companies providing the service, and this covers 250 000 of 700 000 milk cows.

The second venture corresponds to the efforts in identification and registration that each individual farm makes, and are only used within that farm. This method is widely used in commercial agriculture, but the data is of inferior quality, with high levels of loss of information, with little possibility of depicting the situation correctly. The number of animals identified in this manner is estimated at approximately 1.2 million.

System of cattle identification and recording in Chile

Attributes of the system

The system proposed, intends to be of voluntary adscription. However, due to the establishment of incentives for the owners who join the system, wide spread national cover is expected.

The proposed system is simple, consisting of an unique national identification correlative number.

Identification of cattle will be done with duplicated devices, as follows:

- A visual identification tag with bar code allowing an automatic reading, will be put in one ear.
- A duplicated identification device, consisting of a visual tag, or an electronic visual tag, or an intraruminal identification capsule, will be simultaneously used.

Finally in reference to the documents controlling cattle movement, it was decided that the present transit guide (document used in actuality for the transport of cattle) will be used, improved in the aspects of individual identification and access to said information.

System structure and unit functions

The structure of the proposed system is exemplified in Figure 1. As the figure shows, there are three[1] participants in this system, the *central administrative* unit, the *operative* unit and the agriculturists (milk / beef farmers). The duties corresponding to each unit are the ones reported in Figure 1.

Central administrative unit

Some of the functions assigned to this unit are:

- Watch over the efficiency and good use of the system.
- Assign and control the unique identity numbers.
- Develop, modernize and come to a consensus with the technical specifications of the system.
- To hire the necessary information services.
- To be the executive and technical counterpart of any hired service.
- To define levels of access to information.
- Maintain and guarantee access for health services to available information.

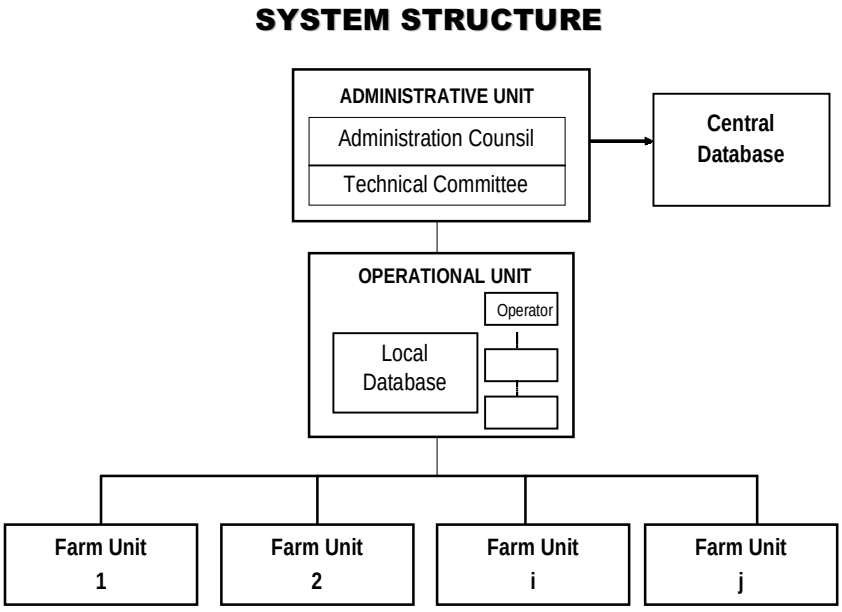


Figura 1. Duties corresponding to each unit.

[1]In this system a fourth unit may be recognized in the *device suppliers*. These suppliers are private companies that will find this an attractive business opportunity, offering different kinds of devices that comply with specifications made by the *central administrative* unit. They will be previously certified to supply their product to those who need them.
Each accredited supplier will be given a numbered rank, defined the administrative unit. This will allow them to mass produce and keep stock of devices (rings), thus making their sales logistics more efficient.
The *device suppliers* will deal with two kinds of clientele:

- The milk / beef farmers who will acquire these devices directly.
- The *operative* units, having once provided service, will themselves offer to supply the farmer's demand for said devices, guaranteeing convenient prices and reliable products.

- Coordinate interaction with private and public entities.
- To certify operative units, suppliers etc.

Operative unit

The concept of *operative* unit was born as an organization that "*facilitates the identification process and guarantees the quality of information obtained from each farm*".
It is a private entity that through its informational service centralizes the information in a clear and suitable manner.

Farm unit

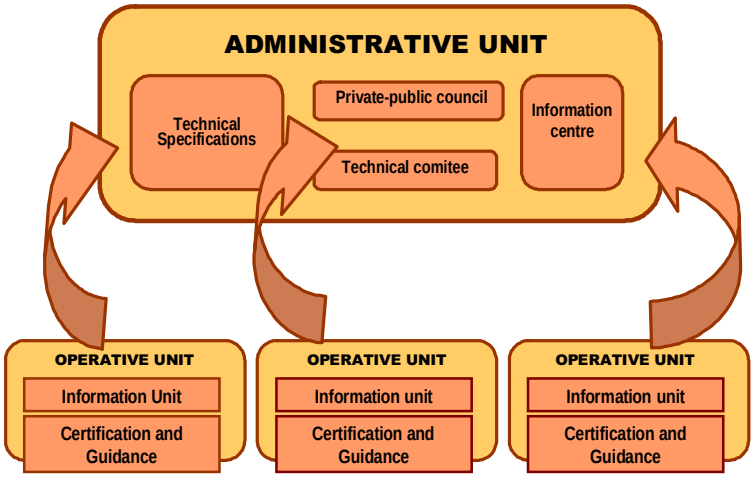
This is a private unit where the information is generated. Said information is gathered by the operative unit to form a centralized data base.
The producer (or farm unit) may choose the operative unit with which to work. A minimum of one operative unit per region will be guaranteed, assuring access to the system for all the producers or farm units.
The farms will de supervised by two separate entities:

- The *operative* unit that will have permanent supervision due to the registry of information that it handles.
- The SAG (Agricultural and Livestock Service), by means of certified veterinarians who will supervise the health and identification of the farm's livestock.

How system components relate

Central Data-base vs. Operative Units

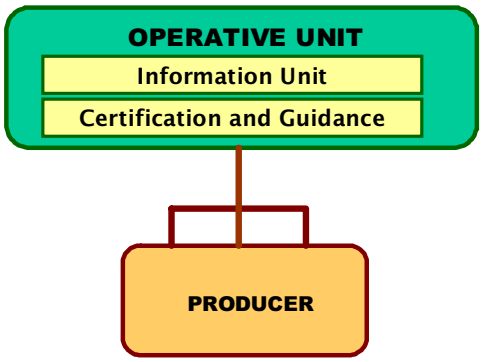
The creation of independent operative units (with their own data-bases) that reliably deliver essential information, previously defined, pertaining to an individual animal to the *central data-base*. The passing of information from operative units to the central data-base is a crucial process in this system.
The aforementioned does **not** limit the amount of information handled, or the services offered by the operative unit. Both are variables that give added value, at the time that the producer decides with which operative unit to work with.



The kind of alliance achieved between the operative unit, farm unit and central data-base (if it outsources this service), will make this decision more or less attractive.
It must be mentioned that a data-base may lend service to more than one operative unit.

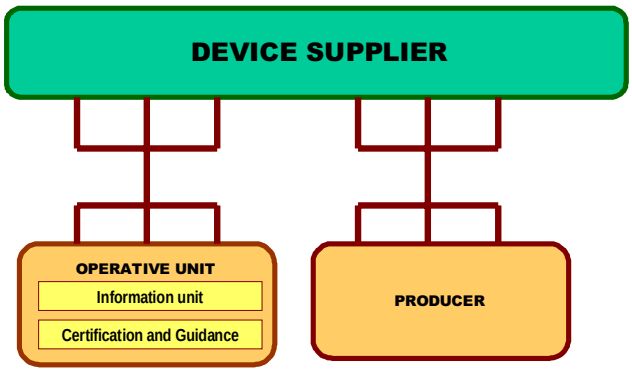
Farm unit vs. Operative Unit

Every producer will be able to turn to an accredited operative unit that controls and acts as officiate of the identification process, being the nexus between producer and the central administration unit.
It is emphasized that the presence of operative units in every region in the country will facilitate the producer's access to the system. If for some reason a region is without an operative unit, the nearest one will be requested to extend its services, guaranteeing in this manner total national coverage.



Operative Unit – Producer vs. Device Suppliers

The *device suppliers* are private entities that will find this system an attractive business opportunity. The operative unit and farm unit will buy identification devices from only certified (certified by the central administration unit) suppliers, opting for the most convenient offer.



Though the operative units and farmers may choose indistinctly any of the accredited device suppliers, it is probable that alliances will form between them, motivated by the suppliers efforts to maintain an optimal level of demand, in order to stay in business.
The necessary communication between these three entities will be of great importance in order to conserve control over the devices they sell, and in doing so, achieve unity. That is how it will be assured that device suppliers and producers alike will inform the operative unit (during periods yet to be defined) of the sale and use of devices (accordingly). This is the only instance where information is doubly checked, validating the consistency of the data.

Financing

The fundamental premise considered in the identification system proposed, is that the consumers (directly or indirectly) be willing to give additional benefits to producers, in return for the correct identification of the farm's animals. This, in addition to the subject of voluntary cooperation, and the fact that it promotes technological advance at farm levels, that it will result in the enhancement of farm productivity, impels a mixed funding.
The design and function of the administrative unit, including the central data-base will be the responsibility of the state. Private entities will be responsible for contributing with those costs related to the identification process itself (identity rings and their placement), as well as the costs involved in maintaining data in the operative unit.
Faced with particular situations, the state can count on support, for example, the incorporation of small-scale agriculture in the system.