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# CASE STUDY FOR THE DUTCH VEAL SECTOR

*Digital traceability for more transparent and inclusive agri-food trade:  
Industry-led data platforms and digital services for agri-food traceability  
and transparency systems*



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The practical case study contains information about the design and implementation of industry-led data platforms and digital services for agri-food traceability and transparency systems in the veal sector in the Netherlands. The Dutch veal sector is recognized for its strong integral model within the complete supply chain. It starts at the dairy farms where the calves are born all up to the slaughterhouses where the veal is produced. An overview of key actors in the Dutch supply chain of veal is given in Figure 1.

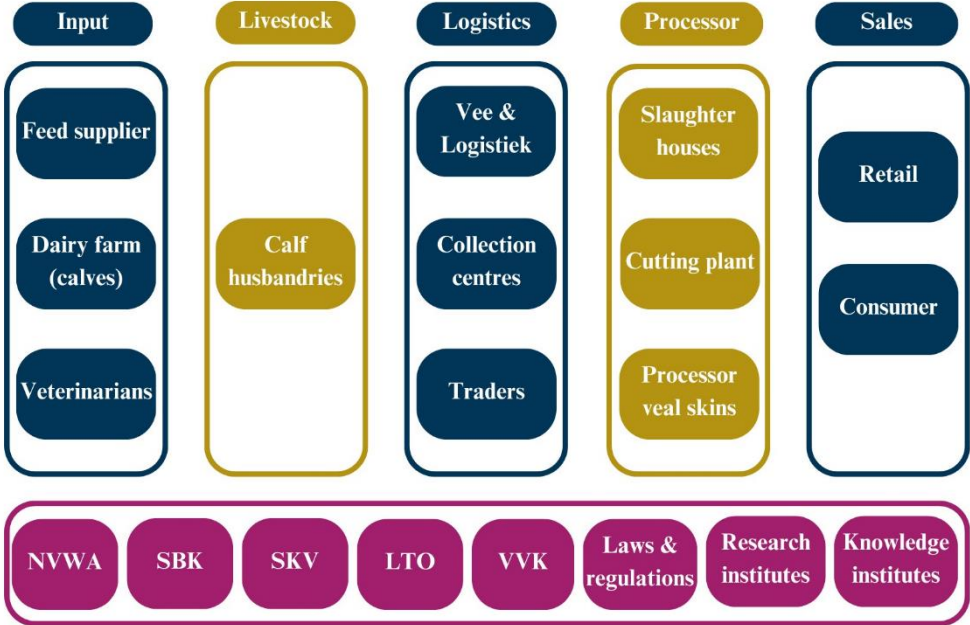


Figure 1. Most important actors in the Dutch supply chain of veal.

The digital traceability system within the sector has been set up by the private sector itself because the entire sector noticed a need for more insight into the data of other actors. The veal and the dairy sectors together identified a need for cooperation in terms of setting up an overarching traceability system, enhancing transparency. The focus was to improve animal welfare and health. Therefore, the overarching quality system Vitaal Kalf and the traceability system Kalf Volg Systeem were built. The overarching quality system Vitaal Kalf is summarized in Figure 2, indicating the most important actors that were or are of influence for the quality system.

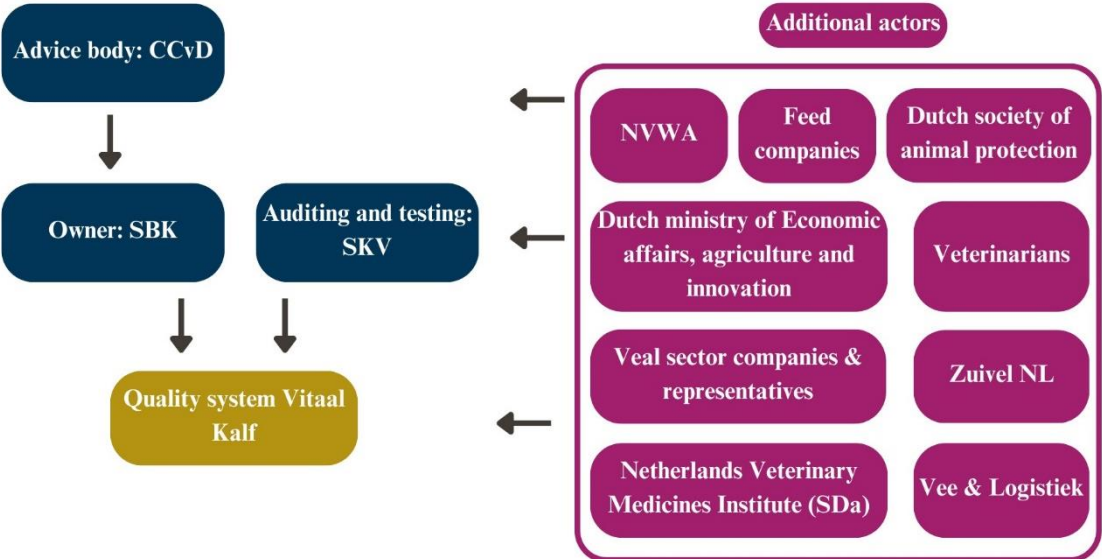


Figure 2. The overarching quality system Vitaal Kalf including the main actors of influence on this system.

The **institutional oversight** in the set-up and execution of the digital traceability system was and is limited. The government leaves most of the responsibility for the development and execution of the traceability system up to the private sector. Overarching organizations take the lead in this, such as the quality control actor Stichting Kwaliteitsgarantie Vleeskalversector (SKV) and the sector organization Stichting Brancheorganisatie Kalversector (SBK). In case measures need to be taken or laws and regulations are violated, the government steps in. The government thus takes the role of a referee, controlling the process while the sector controls each actor and calf. Another role of the government is stimulation through (1) the development of policies and regulatory frameworks and (2) subsidies and investments.

Relevant **policies, laws, and regulatory frameworks** in the Dutch veal sector come from both European and Dutch levels. On the European level, the most important policies regarding data are the Regulation on the free flow of non-personal data (Regulation 2018/1807/EU) and the Open Data Directive (Directive 2019/1024). The Dutch government has invested in ICT infrastructure regarding its physical infrastructure, research, security and integrity, capacity building, and competition issues such as transparency and access. These investments resulted in the ICT systems that are still here today and play a stimulating and enabling role in digitalizing traceability systems and therefore increasing transparency.

In the Dutch veal sector, each calf receives a **unique identification and registration number** which is put into a Dutch public database (I&R system). The same number is the unique number in the quality and traceability system, linked to an individual calf. Each move of the calf is notified in the traceability system. Therefore, you are always aware of where a calf is coming from, where it is located, and where it is going. Linked to this number are several other aspects, such as the date of birth, breed, and sex. This number stays with the calf up to the slaughterhouse where it even stays connected to the carcasses as well. At the processing stages where cuts are taken from the carcass, barcode tags are attached to each meat piece. Because of sequential barcoding, each piece of meat remains linked to the individual calf and its information. The unique barcode remains with each cut until the product is ready and labelled with a sale barcode, that adds the pricing information.

The data infrastructure can be best explained through visualization showing what data is collected at what step in the supply chain. Figure 3 on the next page represents the first half of the supply chain, from the dairy farm to the transport to the calf husbandries, and Figure 4 the second half, from the calf husbandries to the slaughterhouse.

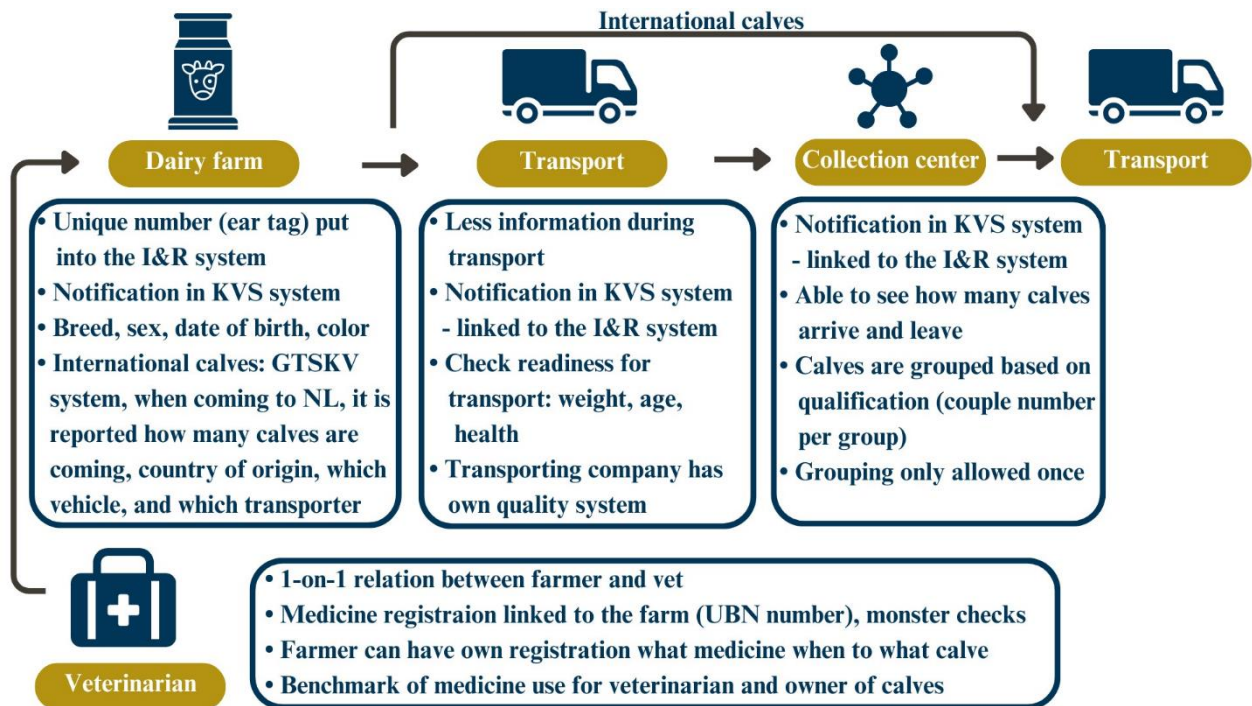


Figure 3. Data collection at each step of the supply chain, from dairy farm to transport to the calf husbandry. Please note that for actors who appear more than once in the value chain, the data collected is only described once.

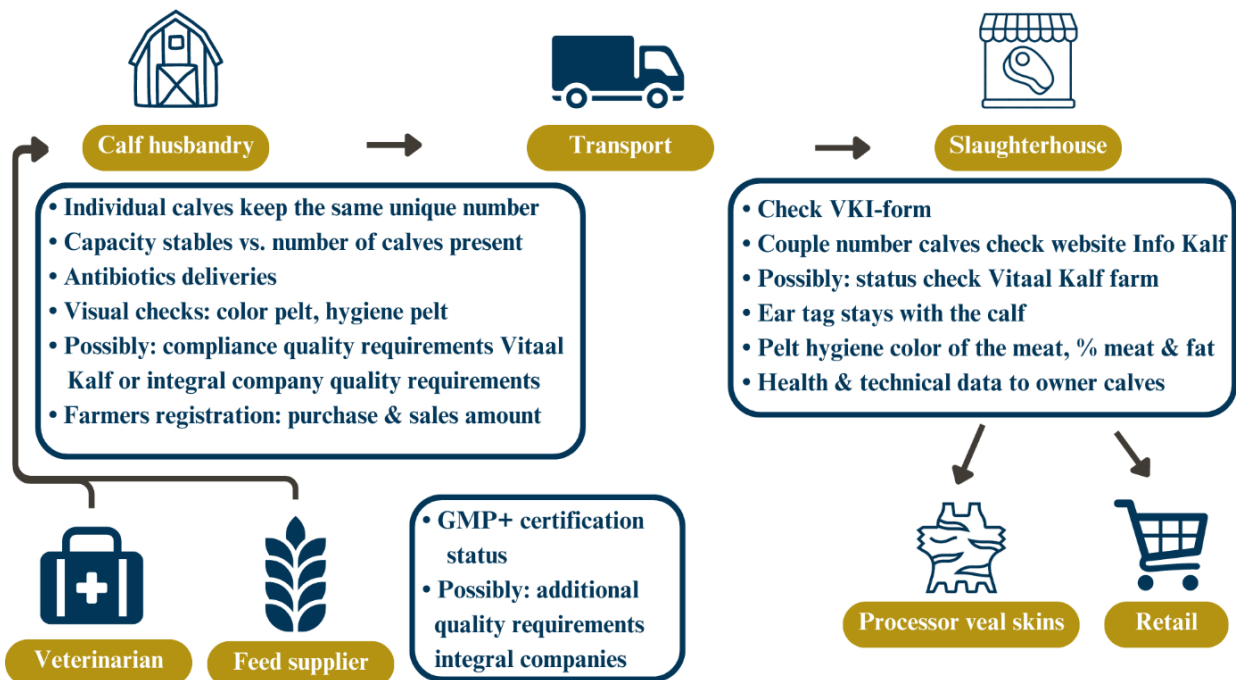


Figure 4. Data collection at each step of the supply chain, from calf husbandry to slaughterhouse. Please note that for actors who appear more than once in the value chain, the data collected is only described once.

Most of this collected **data is used** for tracking and tracing the product (transparency), food safety and quality, and animal welfare and health. Identifying problems and keeping them as small as possible is only feasible when you have enough data. In that case, you can have a clear overview of what is happening at each actor in the chain. An example where the data is used beyond these previously mentioned purposes is at products sold under the label Peter's Farm. These veal products contain a QR code on the package. When consumers scan this code, they are directed to a website containing information about the individual farmer, the farm the calf was brought up, the feed, and unique elements of the environment. This represents not just transparency in the chain, but also towards the consumer.

Although transparency in the supply chain is considered as important, in this chain **data privacy** is considered extra important, since most (veal) farmers work where they live. That means company data is often intertwined with personal data. Nowadays, farmers are more considerate about sharing data and with whom. The **data owner** remains the actor to which the data belongs, e.g., the feed supplier or the owner of the calves. However, there are some examples in the veal sector where this becomes a discussion. The major discussion is between a farmer and the supplier of a certain sensor or machine that automatically collects data. In these cases, the supplier might feel like the data owner, because they deliver the machine that collects the data, although the data is collected on the grounds of the farmer. This discussion might lead to a data lock-in, because when the farmer would change suppliers, often the data remains with the supplier unless the farmer pays for it. Therefore, data portability is an important topic, which makes it possible for farmers to easily transfer data in case they for example switch suppliers. Important agreements for data sharing are: (1) make responsibilities lawful, (2) set clear terms and conditions about what the shared data can be used for, and (3) ensure it is clear who is responsible in case of a data leak.

For actors to share data, there should be clear **incentives** present. In the Dutch veal sector, the main identified incentive for data sharing is to become a transparent chain in which everyone has insight into their supply chain partners. Because of that, actors that are causing problems can be easily identified and the actors that are performing well are able to showcase this. Both a strong shared collective need and a strong individual need are required. The collective need in the sector is the desire to guarantee animal welfare and animal health and decrease the use of antibiotics. This resulted in a shared desire to increase insight into each other's data to ensure that in case of any problems, only the actor that is responsible is affected. The individual need is related to money since having more data on other actors enables you to optimize operational decisions and therefore increase profits or decrease costs and losses.

The major incentive to improve the digital traceability system and therefore transparency is changing market demands. Currently, sustainability is increasingly demanded by consumers and therefore focus has shifted towards plant-based products. The Dutch veal sector now has the incentive to reflect their products as well as possible, to be able to compete with these plant-based products.

Although the traceability system is working very well in the Dutch veal sector, some **limitations** can be identified. The major identified limitation by the interviewed stakeholders was that most data goes to the end of the supply chain and not so much is going back into the chain. Calf husbandries often only hear when something is wrong with their calf, which limits them in continuous improvement management. Also, the quality of data, in combination with a lack of ICT capacity in the sector, in terms of skills and manpower is perceived as a limitation. Dynamic data, coming from sensors, is collected in high volume and mostly unstructured. Transforming this data into interpretable data costs a lot of work and skills, which is not largely present in the sector.

Finally, this case study revealed several **best practices** that can be learned from the Dutch veal sector. The first one relates to the role of the government as they should find the right balance between not

forcing a system on the actors and being able to provide specific rules and regulations that can be further detailed by the sector. The second one is a shared common need of the actors, in which each actor also has a clear individual incentive. This common need was observed throughout the interviews with the stakeholders and was mentioned to be the reason for the current digital traceability system to exist in the first place. It also helps in terms of splitting the costs of the set-up of the digital traceability system, since individual initiatives turn out to be very expensive. Also crucial is a unique key during communication and sharing of information. In the Dutch veal sector, this is the identification and registration number linked to each calf. Without that, data integration is very complex and a standardized flow of data cannot be reached. A learned solution for possible distrust among actors is to have a cooperation data actor who functions as an intermediate party and who is responsible for setting the terms and conditions for data sharing.

For a digital traceability and transparency system to function there should be enough resources available, such as skills and ICT systems. That is where the government can play a role by investing in ICT infrastructures, investing in research in digitalization, and subsidizing projects with a practical focus such as living labs. That way, actors will be stimulated and enabled to contribute to a digital world, opening possibilities for digital traceability and transparency systems.