



Bien-être et élevage du veau de boucherie

Optimisation du bien-être animal et des conditions d'élevage chez le veau de boucherie

Mots clés : veau, bien-être animal, élevage

Auteurs : Didier Bastien¹, Magdélène Chantepedrix¹, Virginie Lefoul¹, Christophe Martineau¹, Etienne Labussière², Manuel Tourtier¹

¹ Institut de l'Élevage, Qualité des carcasses et des viandes, 8, route de Monvoisin, 35650 Le Rheu, France, didier.bastien@idele.fr, magdalena.chantepedrix@idele.fr; virginie.lefoul@idele.fr; christophe.martineau@idele.fr; manuel.tourtier@idele.fr

² PEGASE, INRAE, Institut Agro, Le Clos, 35590 Saint-Gilles, France, ; etienne.labussiere@inrae.fr

E-mail de l'auteur correspondant : didier.bastien@idele.fr

Cet article est une compilation des présentations sur le veau de boucherie au 74^{ème} congrès européen des sciences animales (European Federation of Animal Science [EAAP]) qui s'est tenu à Lyon du 28 août au 1^{er} septembre 2023.

Résumé

Face à des attentes de plus en plus fortes de la société sur les questions de bien-être et de santé animale, et dans un contexte de révision de la réglementation européenne sur le bien-être des animaux d'élevage, plusieurs travaux ont été menés par l'Institut de l'Élevage en collaboration avec divers partenaires dont INRAE. Ces travaux, financés par l'interprofession INTERBEV Veaux ou par le Ministère de l'Agriculture et de la Souveraineté Alimentaire, ont notamment porté sur le recensement des principales attentes de la société concernant la conduite des veaux de boucherie qui ont mis en lumière les volontés de mettre à disposition des animaux : un accès extérieur, une litière pour le couchage, de la lumière naturelle, du fourrage et un logement collectif dès le plus jeune âge. Concernant le logement des animaux, un état des lieux des principales caractéristiques des bâtiments d'élevage utilisés en France pour la production de veaux a été réalisée. De plus, des essais ont également été menés pour acquérir des références sur l'impact de différents paramètres du logement sur le bien-être et la santé des veaux (type de sol, taille des groupes, logement collectif dès le démarrage). Enfin, des études ont été menées sur l'alimentation et la santé des veaux en cours d'élevage pour évaluer d'une part l'impact d'apports différenciés d'aliments solides sur le métabolisme et le comportement des veaux et d'autre part l'utilisation des antibiotiques dans la filière entre 2013 et 2020 suivi de la mise en place d'outils d'évaluations de la biosécurité en élevage.

Abstract: Animal welfare and management of veal calves

In a context where society is increasingly concerned about animal health and welfare issues, and where European regulations on the welfare of farm animals are being revised, the French Livestock Institute has been working on a number of projects in collaboration with various partners, including INRAE. This work, funded by INTERBEV Veaux and the French Ministry of Agriculture and Food Sovereignty, has focused in particular on identifying society's main expectations regarding the management of veal calves, and has highlighted the demand for animals to have outdoor access, a litter for bedding, natural light, roughage and group housing from an early age. Regarding animal housing, an overview of the main characteristics of calf housing facilities used in France was carried out. Trials have also been carried out to acquire references on the impact of different housing parameters on the health and well-being of calves (type of floor, group size, collective housing from the outset). Lastly, studies have been carried out on calf feed and health during rearing to assess the impact of different solid feed intakes on calf metabolism and behaviour, as well as the use of antibiotics in the sector between 2013 and 2020, followed by the introduction of tools for assessing biosecurity in rearing.

INTRODUCTION

In a context of declining production and consumption volumes, French veal production is facing new challenges in terms of changing farming methods. Consumers are increasingly concerned about the welfare and health of their animals. Furthermore, a review of European regulations on animal welfare has been announced, covering veal calf production. In this context, a number of studies have been carried out by the French Livestock Institute in collaboration with different

partners, including INRAE, and with the support of the INTERBEV Veaux interprofession or the Ministry of Agriculture and Food Sovereignty. The aims of this study were to identify societal expectations, to acquire references on the impact of different housing and feeding methods on animals, to assess changes in the use of antibiotics in the sector and to develop tools for assessing biosecurity in livestock farming.

I. VEAL CALVES' WELFARE

Veal calf production: what societal expectations in terms of animal housing for their welfare?

Calf housing is at the heart of societal and regulatory issues. In this context, the “RenouVeau” project, funded by the Ministry of Agriculture, was launched to identify the main societal expectations for this production. Three types of audience were questioned: 1) consumers through an online survey, 2) welfarist NGO through their public statements and 3) students in agricultural schools through an idea competition. Twenty-six student groups (100 students in 11 schools) responded to the competition idea and described their vision of calf breeding in the future. The top issue was the possibility of opening the buildings, with 22 projects, 14 of which provided outdoor access for calves. Projects also highlighted breeding on litter (21 projects), increasing the space allowance per calf (12 projects), providing natural light (7 projects), environmental enrichment (7 projects) and hay in feed (8 projects). The main claims of French welfarist NGO (apart from specific problems linked to transport and slaughter) mainly concern the fact that the animals are kept in individual housing for less than 8 weeks, the

absence of litter on the floor and unsuitable feed (insufficiently rich in iron to meet the market demand for white meat). Almost 2600 consumers responded to the online survey. 58% of them admitted that they did not know how veal calves are bred. Those who said they know this production gave an average score for its image of 5.5 out of 10 (from the most negative to the most positive). Among the negative points, the notions of castration, animal welfare and intensive breeding were mentioned. For housing, 83% of consumers want calves to graze in the summer and 65% want them to have a farm building or shelter in the winter, but with outdoor access. 49% of consumers want a production on litter floor. In conclusion, the main expectations for veal calves are therefore more outdoor access. In addition, societal expectations also relate to group housing of calves from their arrival to fattening farms, with more space, as well as the provision of litter for bedding and a more iron-rich diet.

Impact of individual pen removal on veal calf behaviour

The European Commission plans to phase out the use of cages for farm animals beginning in 2025 (EFSA, 2022). In this context, a trial was conducted to study the impact of the removal of individual pens in veal calf production. 60 male Holstein calves aged 20 days and weighing 49.0 kg were divided into 3 batches and housed for the first 28 days in individual pens (control, IP28), by pairs (pair housing, PH28), or in groups of 5 calves (GROUP). The calves were then fattened in collective pens of 5 calves. The total fattening period lasted 24 weeks. Drinking from buckets in collective pens requires the presence of headlocks that allow the calves to be blocked during milk drinking. Continuous sampling observations were carried out from 6 am to 8 pm on 4 days (D13, D27, D112 and D156). The use of headlocks for the PH28 and GROUP caused stress in the calves (35% of calves stressed in the first two days and 20.7% at 2 weeks). At D13, cross-sucking of the foreskin was more frequent in the PH28 and GROUP (8.2% and 11.1% of their daytime vs 0.4% for IP28, $p < 0.01$). 65% of this activity occurred between 1.5 hours before and 1.5 hours after milk drinking. At D27, this cross-sucking behavior was still very present for PH28 (3.2% of their daytime,

with 65% calves affected compared to 0.0% for IP28, $p < 0.01$, and 1.6% for GROUP being intermediate with 56% of calves affected, NS). In the GROUP batch, 2 calves with high cross-sucking behavior had to be isolated (at D54 and D133) because they were no longer drinking their milk and were losing weight. Positive interactions such as grooming, or muzzle and ear sucking were equivalent between the 3 batches (representing 1.3% of the day's activities). Nevertheless, IP28 spent more time expressing PICA behavior on D13 (7.8% vs 1.5% for the PH28 and GROUP batches, $p < 0.01$). These differences were balanced out during the rest of the fattening period. Furthermore, no significant differences were observed on the number of health treatments per batch (1.7 treatment/calf, NS) or on live weight at slaughter, despite 10 kg difference between IP28 vs PH28 and GROUP (IP28=262.7 kg, PH28=252.5 kg, GROUP=251.9 kg). These results show that rearing male calves in pairs or in groups from arrival at the fattening farms would reduce the PICA behavior at the beginning of the fattening period, but will compensate with an increase in cross-sucking behavior which leads to a loss of appetite and therefore a decline of the animal's weight.

Impact of floor type and group size on veal calf behaviour

Calf housing is at the heart of societal and regulatory issues. In this context, a trial was conducted to study the impact of floor type and group size in veal calf production. 80 male Holstein calves aged 20 days and weighing 52.7 kg were divided into 4 batches: wooden floors with 5 calves per pen (control, W5), wooden floor with 10 calves per pen (W10), rubber floors with 10 calves per pen (R10), and wooden and rubber mixed floors with 10 calves per pen (M10). The calves were individually housed the first 28 days and were fattened for 24 weeks using the same feeding plan and health protocol. Each batch had the same density (1.8 m²/calf). Scan sampling and continuous sampling observations were carried out from 6 am to 8 pm on 3 days (D22, D75 and D145), supplemented by activity measurements from pedometers placed on 5 calves per batch. W10 calves walked more than W5 calves (+20% at mid fattening, NS and +40% at the end of fattening, p<0.05). However, the group size had no effect on lying time (68.2% of the day spent lying for both batches at the beginning of the fattening period, 66.9% at mid-fattening and 65.5% at the

end of fattening), nor on ruminative or stereotypic activities. It also had no impact on the number of health treatments per calf (W5 = 3.2 treatments vs W10 = 3.7 treatments, NS). Total growth rates were also identical (W5 = 1244 g/d vs W10 = 1236 g/d, NS). The calves preferred the rubber floor for lying: 90% of the lying in M10 was done on the rubber floor. However, the lying time was identical between W10, M10 and R10. We measured more steps for R10 than W10 (334 steps/day vs 288 at the beginning of fattening, 524 vs 427 at mid-fattening and 459 vs 414 at the end of fattening), but these differences were NS (M10 being intermediate). 33% of R10 calves were scored dirty during fattening vs 18% for M10 and 1% for W10. This state of cleanliness had an impact on calf grooming (W10 = 4.8% of daily activity in mid fattening vs M10 = 7.1% and R10 = 5.7%). In terms of zootechnical performances, floor type had no effect on calf growth or carcass weight. Nevertheless, it had an impact on carcass colour (W10 = 5% of colored carcasses vs M10= 35% and R10 = 30%).

Veal calf housing in France: current situation and investment needs

A survey on veal calf housing was conducted by the French Livestock Institute, commissioned by INTERBEV Veaux. The main objective was to establish an inventory of the age, state of disrepair and consistency of veal calf housing in France. A second objective was to estimate the cost needed to modernize veal calf housing according to different scenarios that meet the needs expressed by the veal sector. In 2019, the survey was deployed to all French veal calf breeders via a questionnaire accessible on internet. The answers of 405 farms (i.e. 20% of French farms) were analysed, representing 583 farm buildings for 122 000 fattening places. The average size of the farms surveyed was 351 places, with notable differences depending on the region. The farms had an average of 1.6 buildings with a capacity of 213 places. The buildings' average age was 20.7 years. The answers obtained in this survey and those collected in the INOSYS network farms make it possible to provide quantified costs for the modernization of the farm in France according to 5 scenarios: biosecurity, health/welfare, work/automation, environment and

outdoor access for animals (Briand *et al.*, 2022). According to the assumptions, the cost of modernizing buildings extrapolated to all 2 391 French farms in 2019 ranges from 35.8 million euros for the “biosecurity” scenario to 237.2 million euros for the “environment” scenario. The “Outdoor access for animal” scenario has not been qualified, as none of the farms surveyed could evolve in this direction without calling into question the organisation of the existing buildings or without incurring disproportionate investments. This scenario should therefore only be considered in the case of construction of new buildings. In conclusion, it is clear that veal calf housing must evolve by taking into account societal expectations in terms of environmental protection, animal health and welfare and landscape quality. It seems equally important to consider the way in which the “French” farm must adapt to preserve or even improve the organisation of work and ensure a fair remuneration for breeders, and thus guarantee the sustainability of the veal sector.

Promoting and guiding transformation of French veal calf farms in response to societal expectations

Production and consumption of veal calves is a French specificity. France is the largest consumer in the world of veal calves, with 3,2 kgce per capita. In 2022, approximately 1.1 million calves were slaughtered in France, which is the second largest producer in the world behind The Netherlands (Berruyer *et al.*, 2023). More than 60% of male calves from French dairy farms are used as veal calves, which plays a major part in regulating the milk and bovine-meat markets. The French veal sector is coveted by countries that have implemented policies of eliminating dairy calves at birth due to the lack of solutions that allow a better valorisation. In this

context, the French veal sector must adapt to confront new society's challenges such as environmental protection, animal welfare or animal health. How can the veal production systems converge to meet these societal expectations while preserving the working conditions and a fair remuneration of farmers? INTERBEV Veaux and IDELE proposed to answer these questions through a collective project called “Le Veau Durable” (= Sustainable Calves) and composed of 3 parts: - a research programme to evaluate innovative calf production methods that meet these societal expectations, - the construction of a new collective calf innovation and

research center (CIRVEAU), to produce references on these innovative breeding methods, - a demonstration and communication programme to spread and promote the results to professionals in the sector, students, and the scientific community. This collective project aims to guide the French veal industry in its reorganisation for

the next 20 years by accompanying the transformation of its breeding practices. It involves IDELE as a research and development organisation and INTERBEV Veaux as an interprofessional organisation that federates all the links in the French veal sector, from upstream to downstream.

II. MANAGEMENT OF VEAL CALVES

Effect of solid feed intake on feeding behavior and energy metabolism in growing calves

In growing calves reared for the production of veal meat, milk replacers (MR) and solid feeds (SF) are fed simultaneously to support high growth rates and address welfare issues. The combination of these diets is associated with modified feeding behavior, digestion and metabolic processes that may change the utilization of dietary energy for growth compared with the use of MR alone (Labussière *et al.*, 2007 and 2008). The present experiment aimed to determine the effects of increasing levels of SF as substitutes to MR on feeding behavior, physical activity and energy metabolism in growing calves. Twenty Holstein male calves were affected to four dietary treatments in which SF were substituted to MR from 10 to 100%. SF were composed of 87% concentrates, 5% chopped wheat straw and 8% chopped hay. The calves were first adapted to their respective treatments during 100 days until their body weight reached 159 ± 10 kg. MR was given twice daily whereas SF were provided once in the morning. Water and SF were available 18h45 min per day. Thereafter, calves were housed individually in an open-circuit respiration chamber during one week to measure their feeding

behavior, physical and energy balance from total collection of faeces and urine, and measurements of gas exchanges (CH_4 , O_2 and CO_2) to calculate heat production (HP). The latter was partitioned between components due to basal metabolism, physical activity and thermic effect of feeding (TEF). Water evaporation was measured to determine latent heat losses. Intake of SF increased from 404 to 3630 g dry matter (DM)/d while MR intake decreased from 2029 to 0 g DM/d between dietary treatments. When increasing SF intake, the number of meals, feeding rate and time spent standing while eating increased whereas total time spent standing decreased. Total HP increased with increasing SF intake because of increased TEF. The proportion of HP lost *via* a latent route decreased from 45 to 32% when SF increased. Energy balance was not affected suggesting that the lower metabolic efficiency of SF was compensated for by behavioral adaptations. These results suggest that calf behavior and nutrition can adapt to contrasted sources of dietary energy.

SECURIVO: Self-assessment tools for biosecurity in veal calf farms

In France, controlling health in veal calf farming is one of the major and priority challenges of the sector. Biosecurity, whether external or internal, has an impact on health as a preventive factor against disease introduction or spread on farms. Carrying out biosecurity self-assessments is one of the ways of raising farmers' awareness about the need to comply with recommendations and thus improve compliance. In 2015, the interprofession INTERBEV launched a major awareness-raising campaign by creating an interprofessional charter for good health control and proper use of medicinal treatments. In addition, to support farmers in an approach to reduce the use of antibiotics, the French Livestock Institute in partnership with SNGTV and CRAB has developed a specific training course thanks to which, since September 2018, more than 200 farmers have been able to improve their skills on the reasoned use of antibiotics and on the levers

to reduce the risks of emergence of infectious diseases during a dozen training sessions. These training sessions highlighted areas of progress that vary from farm to farm but are undeniable in the sector despite the awareness-raising actions carried out in recent years. In this context, the SECURIVO project has created: (1) 12 technical brochures on biosecurity to help veal calf farmers to improve the biosecurity level of their farms, (2) 2 self-assessments to enable veal calf farmers to self-assess the biosecurity level of their farms: a "detailed" self-assessment for a complete and precise assessment of each biosecurity topic in 123 questions and a "quick" self-assessment for a quick and general assessment in 30 basic questions, (3) A dedicated website to enable veal calf farmers to carry out the self-assessments, to access personalized assessments and to consult technical brochures.

Evolution of the use of antibiotics in the veal calf sector in France between 2013 et 2020

The veal sector participates in Ecoantibio2017 plan by implementing an ambitious program to gain information on practices and identify levers for effective actions to reduce the use of antibiotics on farms. ANSES-ANMV and the French Livestock Institute were commissioned by INTERBEV Veaux to set up a

permanent observatory to estimate the quantities of antibiotics in veal calf farms. This national system was set up in 2016 and is based on active collaboration of breeders, integrators, producer groups and veterinarians and on the support of engineers of the Chamber of Agriculture in Brittany. The observatory is made up of 30

volunteer breeders located in 6 departments in western France. They represent nearly 15 000 calf places, raised in production systems representative of national feeding and housing practices. Farms work for 9 integrators or producer groups. In 2020, data from 47 calf batches (16 553 animals) were analyzed. ALEA is the main standardized indicator used in France for the annual sales

reporting of antibiotics and reached 3.14 in 2020. In the survey carried out by ANSES-Lyon in 2013 on 186 batches of calves, the average ALEA was 5.86 (Jarrige *et al.*, 2017 ; Jarrige *et al.*, 2018). Based on this indicator, the exposure of calves to antibiotics decreased by 45.3% between 2013 and 2020.

CONCLUSION

The two studies carried out on veal calf production in France, firstly on social expectations in terms of animal welfare, and secondly on the main characteristics of the rearing facilities used in France for this production, have enabled us to measure the gaps between expectations and the reality of production. Trials carried out on a different approach to housing calves (starting calves in group pens, fattening them on rubber floors or in large pens) revealed both positive and negative impacts on calf behaviour. While calves move around more when fattened in large

groups, they develop more cross-sucking behavior when put in group housing at start-up. Trials carried out on calf ingestion of solid feed have shown that calf behaviour and nutrition can adapt to contrasted sources of dietary energy, as well as on the impact of different solid feed intakes on calf metabolism and behaviour. Finally, the implementation of biosecurity management tools on farms, combined with training campaigns, has led to a significant reduction in the use of antibiotics on veal calf farms in France.

Références :

- Berruyer M., Blanquet I., Bonnet M., Buczinski B., Chotteau P., Douguet M., Duflo B., Fuchey H., Monniot C., Pineau C., Rubin B., You G. (2023). Dossier annuel de l'économie de l'élevage, Bovins viande, n°536.
- Briand P., Coupin M., Mathieu G., Payrat-Bouzonie E., Simon Y., Blanquet I., Sarzeaud P.(2022). Repères techniques et économiques en élevage de veaux de boucherie 2020-2021. Inosys-Réseaux d'élevages.
- European Food Safety Authority (2022), Farm to Fork Strategy / EFSA mandate on the protection of calves. Public consultation on the scientific opinion on welfare of calves
<https://connect.efsa.europa.eu/RM/s/publicconsultation2/a017U0000011hmT/pc0273>
- Jarrige N., Cazeau G., Morignat E., Chantepedrix M. and Geay E. (2017). Quantitative and Qualitative Analysis of Antimicrobial Usage in White Veal Calves in France. Preventive Veterinary Medicine 144, 158-66.
<https://doi.org/10.1016/j.prevetmed.2017.05.018>.
- Jarrige N., Chantepedrix M. et Gay E. (2018). Exposition des veaux de boucherie aux antibiotiques, Bulletin épidémiologique : santé animale, alimentation, no 82 (8 janvier 2018): 1-4
- Labussière E., Bertrand G., Noblet J. (2007). Les besoins protéiques et énergétiques du veau de boucherie : détermination et facteurs de variation, INRA Productions Animales, 20(5), 355-368.
- Labussière E., Bertrand G., Noblet J. (2008). Effet du remplacement d'une partie de l'aliment d'allaitement par de l'aliment solide sur l'utilisation de l'énergie chez les veaux de boucherie, Rencontres Recherches Ruminants, 15, 275-278.