Activity Report

2024 - 2025

CRSAD

Centre de recherche en sciences animales de Deschambault

ISSN 2818-9973 Activity Report 2024-2025 (PDF version)

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Message from the Chair and Executive Director

Consultation with partners

As part of its work towards the objectives in the 2023–2028 strategic plan, CRSAD consulted with numerous partners in the animal science research community. Meetings were held with producer federations, universities, and research centres to paint a clear picture of the current research ecosystem.

Talks addressed a number of themes, including funding, research priorities, and collaboration opportunities. The process resulted in an appraisal of the situation in 2024 and confirmed the need to strengthen synergy between the actors in our field.

This diagnostic process aims to reposition CRSAD within the research and development (R&D) ecosystem and enhance collaboration between partners. To that end, the creation of a scientific advisory committee in 2025–2026 will encourage open, structured dialogue. In addition, the groups consulted thus far have responded positively, suggesting promising mobilization.

In the fall of 2025, an initial meeting will lay the groundwork for joint reflection on the future of R&D in animal sciences in Québec. CRSAD strongly believes that the involvement of all stakeholders will be essential to meeting the challenges that the coming years will bring.

Governance

CRSAD has nearly achieved its objective of diversifying the backgrounds of its Board of Directors. What's more, as of the 2025 Annual General Meeting, seven of the nine directors will be independent, in line with the preferred standards of sound governance set by Québec's Ministère de l'Agriculture, des Pêcheries et de l'Agroalimentaire (MAPAQ).

The Board also carried out the first self-audit of its activities. The process will be adjusted to align with CRSAD's specific realities, then become an annual requirement. One of the Board's priorities is the ongoing recruitment of new, qualified directors.

In line with this goal, a legal expert has joined the Board of Directors, prompting an in-depth review of administrative policies and the general regulations. The updated documents will be more cohesive and coherent, with no redundancies. They are set to be adopted at the 2025 Annual General Meeting.

Human resources

Recruiting and retaining human resources remains a major challenge. Although day-to-day management is the responsibility of the Executive Director, certain strategic resources are essential to the implementation of the strategic plan. Succession planning is also underway to ensure the continuity of key skills within the organization.

Research and development

Many research projects were accepted in 2024–2025, confirming the relevance of CRSAD's scientific aims. The ratio of research income to grants improved, signifying better financial leverage. The high acceptance rate for submitted projects is a testament to the quality of the research proposals.

Challenges and prospects

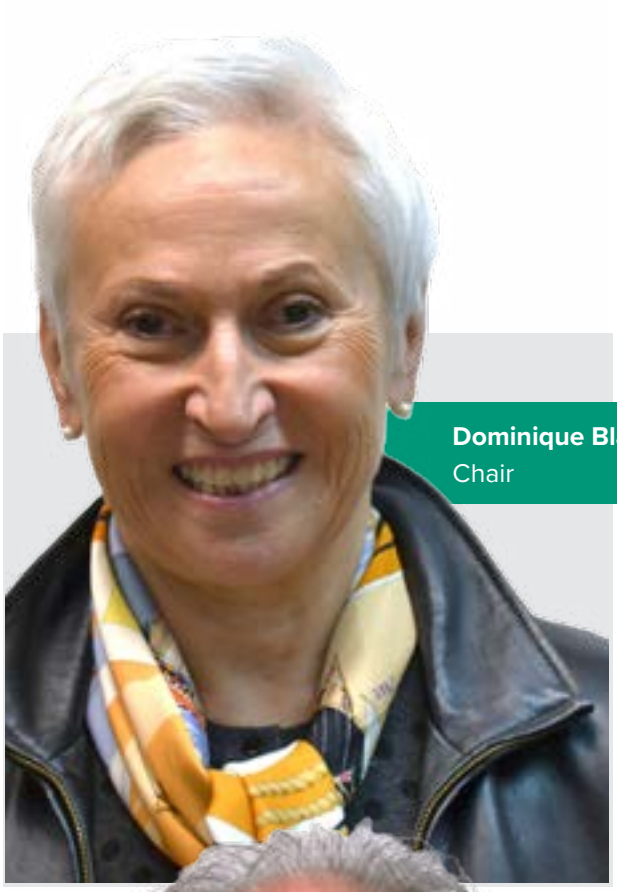
A midterm review of the 2023–2028 strategic plan will be carried out in the fall of 2025. This will allow us to adjust our planning for 2026–2028 to better reflect new opportunities and changes to the ecosystem.

The scientific advisory committee will play a central role in CRSAD's scientific activities. A member of the Board of Directors will sit on the committee to ensure that communication remains smooth and consistent between the directors and scientific management.

The Board hopes that the committee will play an active role in meeting the needs of the community while strengthening CRSAD's influence and improving synergy between its partners.

Conclusion

Backed by the strength of its solid governance and dedicated partners, CRSAD is more than ready to take on future challenges and continue establishing its position as a leader in Québec's animal sciences field



Dominique Blanchard
Chair

Donald Gilbert
Executive Director

Board of Directors

Dominique Blanchard
Chair
Co-opted

Claude Régnier
Vice-chair
Co-opted

Marie Beaubien
Director
Co-opted

Gabriel Belzile
Director
Co-opted

Yvan Fréchette
Director
Co-opted

Danny J. Sohier
Director
Université Laval

Claudie Munger
Director
Co-opted

François Richard
Director
Université Laval

Kevin Wade
Director
McGill University

Tony Savard
Observer
AAC

Pierre Thibeault
Observer
MAPAQ

Donald Gilbert
Executive Director
CRSAD

Fondation of CRSAD

Our mission

CRSAD contributes to research and knowledge transfer in the animal and apicultural sciences. Its specialized research facilities and qualified staff work with universities, centres of expertise, private organizations, and agricultural industries to respond to Québec's agri-food and societal challenges.

Our vision

As a key player that embodies innovation and leadership, CRSAD mobilizes research stakeholders around current and future challenges concerning agricultural competitiveness and sustainability for scientific, economic and societal benefit.

Our values

CRSAD's corporate values are leadership, expertise, diligence, and innovation.

Areas of activity

Milk production

- Dairy cows
- Dairy goats

Meat production

- Cows and calves
- Feeder steers
- Feeder pigs

Egg production

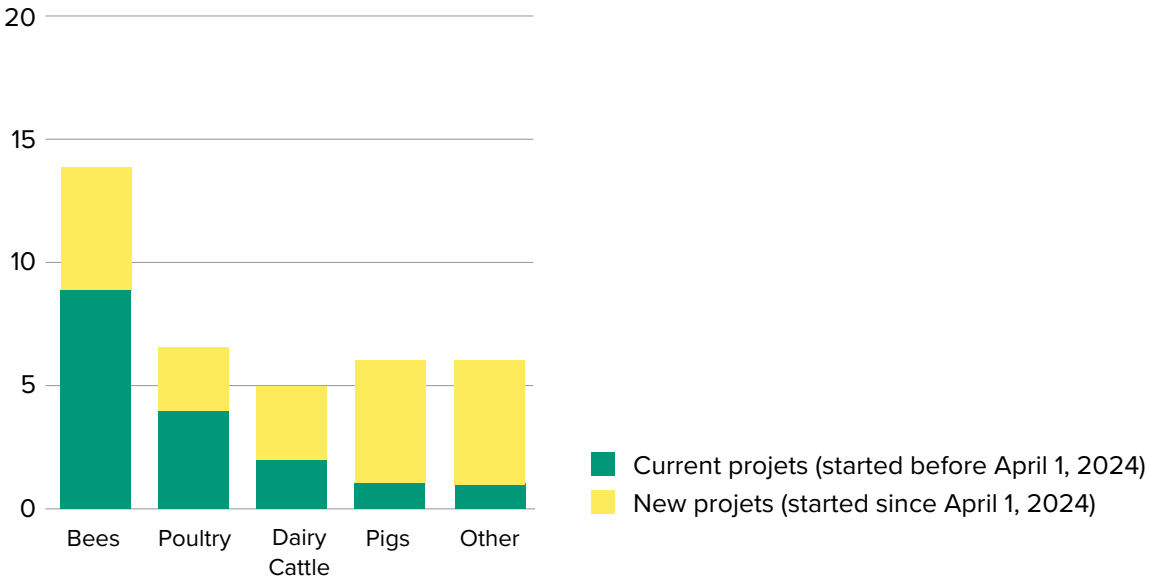
- Laying hens
- Breeding chickens
- Broilers
- Meat turkeys

Beekeeping

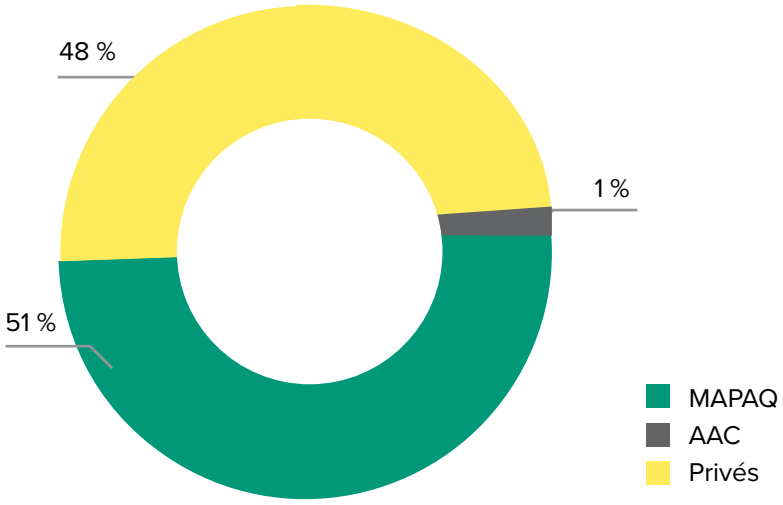
- Genetic selection
- Pollination
- Honey

Research overview...

New and ongoing projets by type of production



R&D funding sources (962 179.86 $)

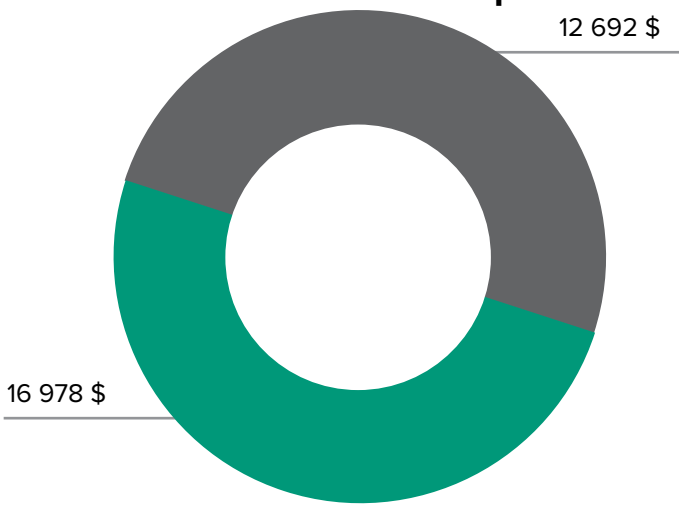


Scholarships and students

The scholarships come from CRSAD, using funds received from the Innov'Action programme.

Around twenty students who are not paid by CRSAD spend their fellowships or graduate-level animal trial phases at our facilities.

Total amount for scholarship



Number of scholarship

Master Ph.D.

Selected research projets

Here are just a few of the 38 research projects conducted at CRSAD this year.

BEES

- Improving the overwintering success of queen banks using different bank colony management methods (page 14)

- Impact of fall sugar type on the survival, health, and productivity of honeybees (*Apis mellifera* L.) (page 16)

PIGS

- Use of dairy polar lipids to improve intestinal integrity, health, and growth performance in piglets (page 18)

POULTRY

- Alternative nutritional strategies to ensure metabolic health in chickens fed low-crude-protein diets (page 20)

- New phytogenic additives as alternatives to anticoccidials in broilers: Study of efficacy and effects on intestinal health (page 22)

Improving the overwintering success of queen banks using different bank colony management methods

Project manager: Andrée Rousseau (CRSAD)
Contributors: Pierre Giovenazzo (Université Laval), Api Culture Hautes-Laurentides, Rayons de miel

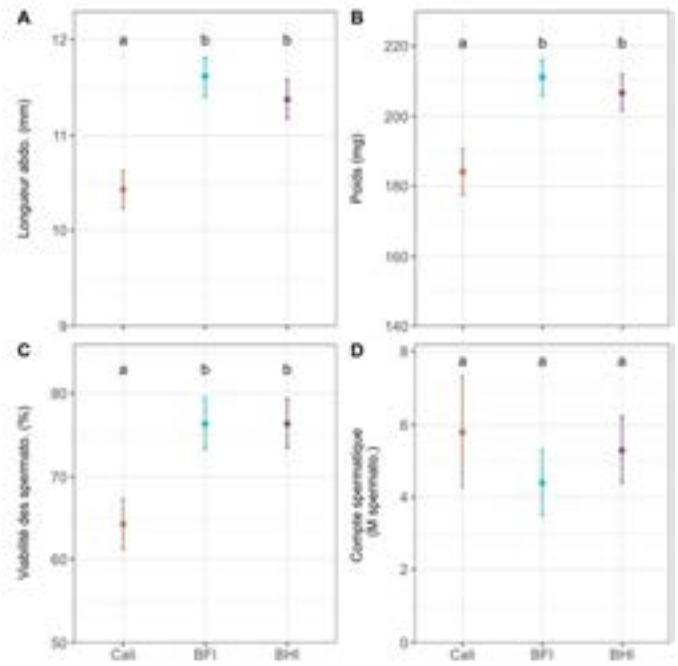
Project objective

Determine the impact of the predatory bee mite *Varroa destructor* on the survival and quality of queens overwintered in banks.

Summary

Since 2018, CRSAD and Université Laval have been working together to develop a technique for overwintering queen bees in the hopes of lessening reliance on imported queens in the spring. The main aim of the study was to assess the impact of parasitism by *Varroa destructor* on the survival and quality of overwintered queens. The results showed that the level of varroa infestation in the fall affects queen survival over winter. Queens overwintered in low-infestation banks (0–1%; LIB) had an average survival rate of 76.7 ± 17.3%, while queens overwintered in moderately infested banks (2–5%; MIB) had a 7% lower survival rate, i.e., 69.4 ± 17.8%. Even so, the difference in varroa infestation did not significantly affect morphological parameters (weight, abdomen length) or fertility (sperm count and viability).

A second objective of the project was to compare the quality and fertility of banked queens with those imported from California. Analyses showed that the imported queens were significantly smaller and lighter and had lower sperm viability than the queens from either group of banks (Figure 1). The study also compared the colony performance of banked queens with that of imported queens. Successful introduction of queens into nuclei reached 94.4%, with no significant difference between groups. However, ten days after introduction, the Californian queens showed more uncapped broods than the LIB and MIB queens. In terms of colony performance, the brood size was similar between queen groups, with a steady increase over the summer. However, honey production was significantly lower in colonies with Californian queens (2.6 kg) compared to those with LIB (12.6 kg) and MIB (11.7 kg) queens. Finally, no significant differences were detected in colony health (varroa mites, viruses, and nosema) between the three groups. Taken together, the results suggest that mass overwintering of local queens is a viable alternative to importing queens.



Expectated applications

The results of this project help validate queen overwintering as a feasible method for queen breeders and beekeepers to replace winter losses. The findings show that the queens performed better than imported queens. In the long term, banking will reduce our dependence on imports and therefore lower the frequency of related problems (biosanitary risks, negative impact of transport on queens, supply challenges, etc.).

Partners

Université Laval, MAPAQ Innov'Action, Api Culture Hautes-Laurentides, Rayons de miel

This project is funded by the Innov'Action agroalimentaire program under the Canadian Agricultural Partnership agreement between the governments of Canada and Québec.

Impact of fall sugar type on the survival, health, and productivity of honeybees (*Apis mellifera* L.)

Project manager: Laurence Plamondon (CRSAD)
Contributors: Two organic beekeepers who wish to remain anonymous

Project objective

Assess how different types of sugar given during fall feeding affect bee colonies' winter survival, health, and productivity.

Summary

In Canada, beekeepers must feed their colonies sugar in the fall to ensure their survival over the winter, when flowers are absent. Sugar syrup is the most common choice because of its availability, chemical stability, and ease of use. However, upcoming revisions to Canadian organic standards are expected to prohibit the use of conventional sugar syrup, forcing organic beekeepers to turn to organic honey or sugar syrup for overwintering. The effects of this change on colony survival, development, productivity, and pathogen prevalence remain poorly documented. The study examined colonies of honeybees (*Apis mellifera* L.) fed with conventional sugar syrup, organic sugar syrup, summer honey, and fall honey.

It measured parameters such as winter survival, colony development, honey production, and the presence of pathogens (*Varroa destructor, Vairimorpha spp.*, and six viruses). It found that organic sugar syrup, summer honey, and fall honey are viable alternatives to conventional syrup for overwintering. However, managing colony weight after feeding is crucial to prevent starvation. In general, a minimum of nine frames of honey in a Langstroth single brood box, or four frames of honey accompanied by 12 L of organic syrup, are needed for successful overwintering. Adjustments may be necessary depending on colony size and winter severity. No statistically significant differences were observed between treatments with regard to brood and bee population development, honey production, or the presence of pathogens. These results suggest that organic beekeepers can effectively overwinter their colonies using alternative carbohydrate sources, while remaining mindful of reserve management.

Expected applications

As the new Canadian standards approach, this demonstration that different diets do not significantly affect colony development, production, and pathogen dynamics will help guide organic beekeepers towards viable, compliant alternatives that do not compromise performance.

Partners

CRSAD, AADQ, anonymous organic beekeepers, Alberta Beekeepers Commission, British Columbia Honey Producers Association

This project is funded by the Innov'Action agroalimentaire program under the Canada-Quebec Agreement on the Canadian Agricultural Partnership between the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ) and Agriculture and Agri-Food Canada.

Use of dairy polar lipids to improve intestinal integrity, health, and growth performance in piglets

Project manager: Daniel E. Rico (CRSAD)
Contributors: Marie-Pierre Létourneau-Montminy (Université Laval), Janie Lévesque (CRSAD), J. Eduardo Rico (University of Pennsylvania)
Master's students: Université Laval (1), Santa Catarina State University (1)

Project objectives

- Characterize the effects of a cheesemaking by product (ultrafiltered whey) that is rich in polar lipids.
- Evaluate the impact of these lipids on piglets' inflammatory status, gut health, microbiota, lipid metabolism markers, and growth performance around weaning.

Summary

Weaned male piglets (*n* = 240; 21 days old; 6.3 ± 0.5 kg live weight) were grouped by starting weight and allocated to 48 pens of 5 animals each in a 3 × 2 randomized complete block design. Two diets—a soy lipid diet (*n* = 24 pens; SD) and a polar lipid diet (*n* = 24 pens; PD)—were randomly distributed among the piglets and given from days 0 to 21 of the experiment.

The diets contained 20% CP, 6.5% fat, and 3.4 Mcal/kg ME. Within each group, animals received one of three milk replacers: 1) commercial (CO); 2) soy lipids (SO); or 3) polar lipids (PO). Contrary to our hypothesis, the addition of polar lipids to growing piglets' diet did not lead to improved animal performance, but rather to compromised growth rates, which could be related to the high dose used in the feed. Minor changes were observed in the composition of the microbiota, with a slight increase in diversity after 3 weeks on the polar lipid diet. Plasma lipidomic analyses revealed an altered triglyceride profile, while other lipid types, such as sphingolipids and ceramides, were unaffected.

Expected applications

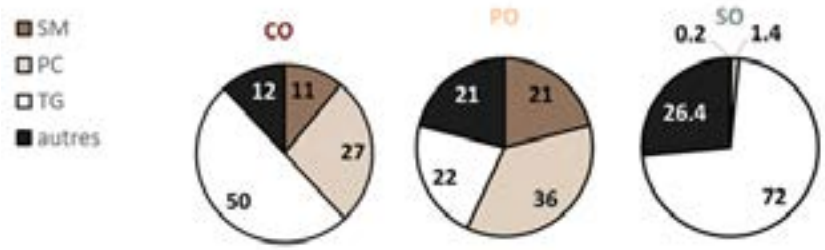
Depending on market availability and price, there is interest in developing this by product of the dairy processing industry as a lipid- and protein-rich food ingredient. Potential anti-inflammatory effects should be tested in models with more pronounced environmental or metabolic challenges.

Future studies should focus on the optimal dose of similar dairy industry products that can be used in piglet feed, as they can provide high-quality

lipids and proteins.

Figure 1. Lipid composition of diets based on soy lipids (SD) and polar lipids (PD). SM = sphingomyelin, PC = phosphatidylcholine, TG = triglycerides.

Figure 2. Lipid composition of control (CO), polar-lipid-based (PO), and soy-lipid-based (SO) milk replacers. SM = sphingomyelin, PC = phosphatidylcholine, TG = triglycerides.



Partners

Université Laval, MAPAQ-Innov'Action
IA-120628

This project is funded by the Innov'Action agroalimentaire program under the Canadian Agricultural Partnership agreement between the governments of Canada and Québec.

Alternative nutritional strategies to ensure metabolic health in chickens fed low-crude-protein diets

Project manager: Angel René Alfonso Avila (CRSAD)
Contributors: Marie-Pierre Létourneau-Montminy (Université Laval), Juliano Cesar de Paula Dorigam (Evonik)
PhD students: Evonik (1)

Project objective

Determine the effects of nutrients with functional roles on metabolic health and zootechnical performance in chickens receiving low-crude-protein (CP) feed.

Summary

The global need to reduce the environmental footprint while maintaining broilers' zootechnical performance, as well as improving their health and welfare, has led to the adoption of nutritional strategies that are low in crude protein (CP). Moreover, the availability and affordability of food-grade amino acids (AAs) make the implementation of such strategies technically and economically viable. This approach is based on the concept of "ideal protein" and suggests that low-CP diets enriched with essential AAs support optimal performance. In practice, however, this strategy does not always fully preserve the animals' performance.

More specifically, the higher starch content of these diets, combined with the physiological changes observed in broilers (notably increased fat deposition and liver weight) and higher feed conversion ratio, suggest that metabolic disturbances may occur. To limit the so-called "carb toxicity" of these diets, alternative nutrition and immunonutrition strategies have been proposed. These are based on supplementation with antioxidant precursors, methyl group donors, and exogenous ketone bodies (EKBs), with the aim of reducing oxidative stress, improving liver health, and restoring energy balance.

It has thus been proposed that the success of low-CP diets depends not only on a good AA balance, but also on the additive or synergistic effect of specific nutrients involved in the management of metabolic stress. In our study, reducing the CP by two percentage points during the growth and finishing phases maintained performance levels comparable to those of the control group. However, the use of functional nutrients to support metabolic health in this context generated variable responses.

Firstly, butyric acid was validated as an effective precursor of ketone bodies, representing an

alternative energy source. Birds with inclusion levels of 0.01%, 0.05%, and 0.1% maintained similar live weights between treatments. Antioxidants such as organic selenium, capsaicin, and vitamin C also helped preserve body weight despite the drop in CP. Selenium, in particular, reduced fat deposition at the end of the cycle. Furthermore, methyl group donors such as choline, vitamin B12, and betaine helped maintain the live weight of chickens fed a low-CP diet, while vitamin B9 (folate) had a deleterious effect.

These functional nutrients help compensate for the specific needs resulting from the metabolic stress associated with reduced CP, while supporting broiler growth and efficiency.

Expected applications

As the project included three components addressing the metabolic limits associated with CP reduction and was aimed at validating proofs of concept or applying existing strategies, nutrient supplementation will need to be assessed and adjusted to the specific needs arising from this approach. In concrete terms, although the effectiveness of butyric acid as a potential source of ketone bodies has been demonstrated, it has yet to be validated under commercial conditions. The inclusion of choline, which has shown benefits for both metabolic health and performance, should also be a key part of strategies that accompany CP reduction. In parallel, it will be essential to examine the additive effects of methyl group donors, such as vitamins B9 and B12. Finally, a dose-response study targeting the most relevant antioxidant sources, notably vitamin C, should be carried out to better define their ideal levels in this context.

Partners

MAPAQ-Innov'Action, Université Laval, Evonik

This project is funded by the Innov'Action agroalimentaire program under the Canadian Agricultural Partnership agreement between the governments of Canada and Québec.

New phytogenic additives as alternatives to anticoccidials in broilers: Study of efficacy and effects on intestinal health

Project manager: Carl Julien (CRSAD)
Contributors: Marie-Pierre Létourneau-Montminy (Université Laval), Bertrand Medina (Probiotech International), Jacinthe Julien and Vincent Demers-Caron (CRSAD)
Intern: Université Laval (1)
Master's student: Université Laval (1)

Project objective

Evaluate the effects of new, functional plant-based feed additives on coccidiosis treatment and determine their effects on intestinal health in broiler chickens.

Summary

Demand for drug-free consumer products is growing steadily. However, some common broiler infections (such as avian coccidiosis) affect health and production, requiring the use of alternatives to antimicrobials.

The aim of this study was to evaluate the effects of new, functional plant-based feed additives on coccidiosis treatment and determine their effects on intestinal health in broiler chickens. Two 34-day cage trials with 12 replicates of 12 birds/cage were carried out. Male broilers (Ross 308) were randomly assigned to 8 treatments per trial. Intestinal inflammation and coccidiosis challenges were used. Eimeria infection was induced on day 14 via oral administration of 2 x 105 sporulated oocysts of mixed Eimeria species from field isolates. Growth performance was assessed by measuring body weight, feed intake and conversion, and average daily gain. The effect on coccidiosis was assessed by measuring gut lesion scores and total oocyst counts using microscopy and quantitative PCR. Technical and financial feasibility were assessed based on additive costs and bird weight. Intestinal health was studied through gene expression and protein quantification analyses.

As expected, the coccidia challenge reduced growth performance and increased parasite excretion and characteristic lesion scores. Laboratory results showed that several compounds—such as polyphenols and cinnamon, thyme, garlic, anise, basil, and pine extracts—reduced the invasiveness of Eimeria parasites to concentrations that did not result in host cell toxicity. In broiler chickens, feed and drinking water additives containing these active compounds (namely Alterna Poultry®, CAPS C2PG®, and Entero-V Poultry®) improved intestinal

permeability during the inflammatory or coccidiosis challenge, and Entero-V Poultry® reduced parasite excretion.

Expected applications

Alterna Poultry®, CAPS C2PG®, and Entero-V Poultry® phytogenic additives can improve intestinal health when intestinal inflammation is present. Entero-V Poultry®, which also reduces excretion of the parasite that causes coccidiosis, can be used as part of a coccidiosis control strategy. These additives can therefore be helpful in reducing the use of antimicrobials in poultry houses. Trials in commercial poultry houses could validate these results.

Partenaires

Université Laval, MAPAQ, CRSAD, Probiotech International, Mitacs

Highlights

“Abeilles en santé, planète en santé” booth at the Eurêka! festival

In June 2024, members of the CRSAD team and Professor Pierre Giovenazzo’s laboratory explained to delighted families how pollinators are important to human survival. Participants also got the chance to see a colony of honeybees up close and taste different types of honey produced in Québec—a great way to introduce youngsters to science!

Retirements

It is with immense gratitude that CRSAD marks the retirement of Sonia Fournier and Hélène Lavallée, after 33 and 37 years of dedicated service and unwavering commitment. Sonia and Hélène, we wish you well and hope you enjoy a wonderful retirement full of new adventures!

New hires

CRSAD welcomes its new employees: ***foreman Mario Paquet, poultry and swine worker Dany Gariépy, and apiculture research professional Sara Bouaziz.***

Apinov

Marilène Paillard, CRSAD project manager, visited Apinov in France twice to take advantage of its expertise in drone semen collection.

Apicultural advisory services

Second-line apicultural science service

The second-line apicultural science service works closely with players in the beekeeping sector to meet beekeepers' needs and address their challenges. Priorities for action are established, among other things, with members of the Table filière apicole (beekeeping industry roundtable). They can be revised throughout the year depending on needs.

This year, the second-line service surveyed Québec beekeepers to identify research projects relevant to their businesses and issues, participated in the working group for the revision of the Organic Federation of Canada's organic beekeeping standards, and collaborated with MAPAQ, the Table filière apicole, and Université de Montréal to produce a decision tree for varroa treatment. This simple tool, which is available in French only, makes it easier for beekeepers to decide how to treat varroa mites in their colonies. Physical copies were distributed during the PISAQ campaigns in the summer of 2024 and elsewhere, and a PDF version is available on the MAPAQ website.

The service also applied for several grants in 2024 in anticipation of activities planned for 2025, such as the organization of a honey-themed beekeeping day and the updating of *Préparation et commercialisation des produits de l'abeille* (a guide on preparing and selling bee products), both of which involved collaboration with the CRAAQ. A request was also submitted to start an institutional collaboration with a French group.

Individual advisory services

In February 2025, CRSAD welcomed a new member to its team. Sara Bouaziz supports the second-line apicultural service and is in charge of individual advisory services for beekeepers in Québec. Services are now available in a number of areas, including:

- Support for starting up a beekeeping business
- Assessment of breeding practices and reporting on apiary management
- Support for and optimization of seasonal operations
- Disease and parasite management
- Organization and optimization of data collection systems
- Support for project development and preparation of grant applications

Guides, training, and tours

Webinars

In 2024, the CRSAD beekeeping team held seven webinars in collaboration with various specialists.

The webinars are available to watch on the CRSAD YouTube page. They have been viewed between 154 and 2,078 times.

Au rucher cette semaine beekeeping column

"Au rucher cette semaine" is a beekeeping newsletter that is emailed to members of Apiculteurs et apicultrices du Québec and posted in the Bulletin apiculture section of the Agri-Réseau website.

The column covers various topics related to the time of year, beekeeping best practices, and scientific news.

In 2024, 22 columns were published. They were viewed between 651 and 4,439 times, depending on the topic.

Two educational activities were held in 2024: "L'abeille et la ruche" (training for professionals working at the Ministère de l'Agriculture et de l'Alimentation du Québec and the Financière agricole du Québec) and a tour of the university apiary for students in Pierre Giovenazzo's apiology course and Valérie Fournier's agricultural entomology course. These two practical and theoretical activities introduced participants to Québec's beekeeping sector and the issues it faces, taught them about the main phases in the beekeeping cycle, and showed them how to identify the main parts of a hive and a colony.

CRSAD's university apiary also welcomed 25 students from the Collège d'Alma's ACS program on apiary operation to complete their practical training for the colony dynamics, colony health, and hive management courses.

Scientific publications

Here are few scientific articles published as part of projects conducted at CRSAD. All published articles are available on the CRSAD website.

Effects of summer treatment against Varroa destructor on viral load and colony performance of Apis mellifera colonies in Eastern Canada L. Plamondon, M. Paillard, C. Julien, P. Dubreuil, P. Giovenazzo

Is there a right time for dairy Alpine goat kid weaning : How does the weaning age of dairy Alpine goat kids affect their growth and behavior? S. Bélanger-Naud, T. Wolfe, A. Zambelis, J. Lévesque, C. Julien, E. Vasseur

Impact of processing steps (filtration, creaming and pasteurization) on the botanical classification of honey using LC-QTOF-MS L. Tian, S. Bilamjian, D. Cuthbertson, T. Anumol, L. De Leoz, C. Julien, P. Giovenazzo, S. Chahal, S. Bayen

The impact of thermal stress on intestinal health and productivity of dairy cows - Chapter 12 Environnemental effects on gut health in production animals D.E. Rico, A. Razzaghi, J.E. Rico

Understanding the cause and consequences of variability in the compositionnel quality of milk D. E. Rico

Modulation of the Plasma Lipodomic Profile Fed Polar Lipid-Rich Diets R. Larsen, S. Chakroun, M.-P. Létourneau-Montminy, J. Lévesque, D. Estrasulas de Oliveira, J. E. Rico, D. E. Rico

Evaluation of plasma biotin, folate and vitamin B12 concentration of Holstein dairy cows fed adequate of high concentrations of dietary vitamin D3, vitamin E, calcium and selenium under heat stress M. Duplessis, A. Ruiz-González, D. E. Rico

Increased dietary methionine, lysine and histidine supply modulated the heat stress-inducted metabolic remodeling of dairy cows E. Jorge-Smeding. A. Ruiz-Gonzlez, Y. H. Leung, A. Ins Trujillo, L. Astessiano, D. R. Ouellet, H. Lapierre, D. E. Rico, Á. Kenéz

CRSAD team

Management

Donald Gilbert, Executive Director

Mathieu Bletzacker, Financial Director

Annie Dumas, Operations Director

Mario Paquet, Foreman

Daniel Rico, Research Director

Hassina Yacini, Project Management Director

Administration

Audrey Bourgoin, Human Resources Executive Assistant

Jocelyne Couture, Office Agent

Sonia Fournier, Office Agent*

Annie Harvey, Executive Assistant

Sabrina Provost, Office Agent

Research and development

Angel René Alfonso Avila, Researcher

Martine Bernier, Beekeeping Projet Manager

Carl Julien, Researcher

Georges Martin, Beekeeping Projet Manager

Segolène Maucourt, Contract Researcher

Marilène Paillard, Beekeeping Projet Manager

Daniel Rico, Research Director and Scientist

Andrée Rousseau, Researcher

Hector Salgado, chargé de projets

Technicians and research professionals

Sara Bouaziz, Research Professional

Vincent Demers-Caron, Research Professional

Jacinthe Julien, Research Professional

Hélène Lavallée, Animal Production Technician*

Laurence Plamondon, Research Professional

Animal workers

Samuel Agueda Lopez, dairy goats

Delter Ahimar Agueda Mazariegos, poultry and pigs

Mike Allard, maintenance and field crops

Laurie Beaulieu, poultry and pigs

Michaël Benoît, bees

Philippe Cantin, dairy cattle

Jose Chach Monroy, bees

Édith Desmarais, beef cattle

Marianne Gagnon, poultry and pigs

Dany Gariépy, poultry and pigs

Luc Gignac, beef cattle

Emma Joaquina Juarez Ruiz, poultry and pigs

Stéphane Julien, dairy cattle

Cassandra Mattioli, dairy cattle

Agathe Montambault, dairy goats

Jonathan Moreau, dairy cattle

Donald Vallée, maintenance and field crops

Ervin Yuvini Zacarias Tomas, poultry and pigs *

* *left during the year*

Performances of our permanent animals

Bees

Colonies overwintered :	448
Colonies overwintered outdoors :	76
Colonies overwintered indoors (repository) :	372
Winter losses (colonies) :	176
Colonies in spring :	272
Colonies added :	270
Winter losses (%) :	39
Summer losses (%) :	19
Colonies at the end of the beekeeping saison :	440

Production

Nombre of apiaries :	23
Hives in production :	257
Total honey produced (kg) :	3 513
Average honey per colony (kg) :	13.7

Dairy cows

Average number of Holstein cows :	84

Annual production per cow

Milk (kg) :	10 390
Fat (kg) :	448
Protein (kg) :	365

Other

Age of helfers at calving (year-month) :	1-10
Calving Interval (days) :	381
Culling rate (%) :	18

Dairy goats

Average number of Alpine goats :	84

Production

Milk (kg) :	1 291
Fat (kg) :	47
Protein (kg) :	41

Other

Average weight of kids at weaning (kg) :	15.6
Average weight of kids at service (kg) :	34.3

Breed class average (BCA)

Milk :	228
Fat :	230
Protein :	245

Beef cows

Average number of Angus-Simmental :	53
Total carvings :	52

Zootechnical performance

Calf birth weight (kg) :	38.5
Calf weaning weight (kg) :	316
Age of calves before weaning (days) :	225
ADG of calves before weaning (kg/d) :	2.72
Mortality rate before weaning (%) :	0
Average calving Interval (days) :	353
Average age of heifers at first calving (months) :	23
Calves resulting from insemination (%) :	40.7

Our research partners

- Agriculture and Agri-Food Canada (AAFC)
- Agri-Marché
- Alberta Beekeepers Commission
- Alfalfa Seed Commission
- Api Culture Hautes Laurentides inc.
- Apinov
- British Columbia Honey Producers Association
- Canadian Honey Council
- Centre de développement du porc du Québec (CDPQ)
- Ceva Biovac (France)
- Citadelle - Maple Syrup Producers' Cooperative
- Collège d'Alma
- Consortium for Research and Innovation in Industrial Bioprocesses in Quebec (CRIBIQ)
- Couvoir Scott
- Dairy Farmers of Canada
- Egg Farmers of Canada
- ETH Zurich
- Evonik
- Financière agricole du Québec
- Genome Canada
- Génome Québec
- Groupe Cérès inc.
- INRAe
- Jefo Nutrition inc.
- Lactanet
- Lallemand
- Les Apiculteurs et Apicultrices du Québec (AADQ)
- Les Éleveurs de porcs du Québec (EPQ)
- Les Éleveurs de volailles du Québec (EVQ)
- McGill University
- Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ)
  -Innov'Action program
  -Food Innovation Program
  -PADAAR Program
- Mitacs
- Novalait
- Olymel
- Probiotech International inc.
- Quebec Reference Center for Agriculture and Agri-Food (CRAAQ)
- Rayon de miel
- Research and Development Institute for the Agri-Environment (IRDA)
- Santa Catarina State University
- Sollio Agriculture
- Stanabbey
- Université Laval
- Université de Montréal – Faculté de médecine vétérinaire (FMV)
- Université de Sherbrooke
- Université du Québec à Montréal (UQÀM)
- University of Pennsylvania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