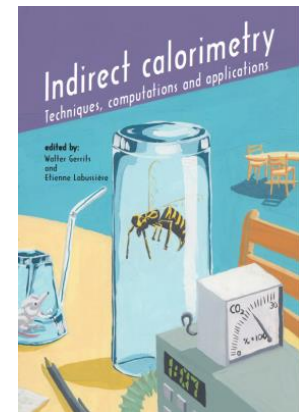


Course on indirect calorimetry



Directly following the 8th International Symposium on Energy and Protein Metabolism and Nutrition in Rostock-Warnemünde, Germany from September 15-18, 2025, **Wageningen University, the Netherlands (WU)**, and **INRAE, France** will jointly organize a workshop on indirect calorimetry and selected applications. The course will be held on **September 18-19, 2025 in Dummerstorf**.

For whom?

The course is aimed at educating those (PhD students, technical staff, researchers) who use measurements of gaseous exchange (CO_2 , O_2 , CH_4 , etc) in their research program, and/or are setting up facilities in which those measures can be performed, either with or without climate control. Depending on the level of experience of the audience, we intend to provide lectures/practicals for sensible experimental designs and advanced data analysis.

Organization

The organization will be a joint effort of Wageningen University and INRAE and will be hosted by Research Institute for Farm Animal Biology (FBN) in Dummerstorf. Parts of the course will be taught by experts in the field from other institutions.

Preliminary program

In the course, attention will be paid to the basics of indirect calorimetry, i.e. i) setting up calorimetry units for animals of different size (insect to cow); ii) the measurement of gas exchange; iii) dealing with the data: Brouwer's equation and modelling techniques. Furthermore, selected applications will be presented and discussed, including i) separating heat production into activity related and activity free; ii) working with companion animals; iii) measuring methane emission in respiration chambers or using alternative techniques. The course will comprise lectures and computer practicals. Hands-on experience can be gained while performing a CO_2 recovery test at the facilities of FBN.

Submitting posters

A poster-session will be organized to facilitate exchange of experiences between participants. Posters are welcomed (but no obligation!) on i) technicalities of indirect calorimetry or related measurements; ii) development of applications for indirect calorimetry units.

Registration and fee

Registration before May 30, 2025 via the secretariat of the Animal Nutrition Group at WU. Please use the registration form below.

The registration fee will be €400 for PhD students and post-doc researchers and €800 for other participants. It includes dinner on Thursday 18/9, lunch on Friday 19/9 and the book: Indirect Calorimetry – techniques, computations and applications, which will be used as course material. Lodging arrangements are your responsibility. The maximum number of participants is 20, and will be dealt with on a first-come first serve basis. If the number of registrations does not exceed 15 the course will be cancelled. In that case, registrants will be notified before June 15.

More information

For further information please contact Walter Gerrits at walter.gerrits@wur.nl

Wageningen University
Walter.J.J. Gerrits, PhD
Professor in Animal Nutrition
Wageningen University, NL

INRAE
Etienne Labussière, PhD
Researcher Feeding and Nutrition
INRAE Rennes, FR



Preliminary Programme Course on Indirect Calorimetry

Thursday September 18	
15:00 – 15:15	Welcome, intro to course Course overview <i>Walter Gerrits, Wageningen UR, NL</i>
15:15 – 16:00	Design of calorimeters Part 1 Background and general principles <i>Marcel Heetkamp, Wageningen UR, NL</i> <i>Etienne Labussière, INRAE, FR</i>
16:00 – 18:00	Tour and practical recovery testing 2 groups in 2 sessions <i>Manfred Mielenz, FBN, GE</i> <i>Björn Kuhla, FBN, GE</i>
18:00 – 19:30	Informal Dinner & poster viewing
19:30 – 20:15	Design of calorimeters Part 2 Background and general principles <i>Marcel Heetkamp, Wageningen UR, NL</i> <i>Etienne Labussière, INRAE, FR</i>
20:15 – 21:00	Indirect calorimetry Calculating heat production from gas exchange <i>Walter Gerrits, Wageningen UR, NL</i> <i>Etienne Labussière, INRAE, FR</i>
End of day 1; enough time to travel back to Rostock for the night	
Friday September 19	
9:00 – 9:45	Stoichiometry of nutrient metabolism From intracellular to whole animal level <i>Jaap van Milgen, INRAE, FR</i>
9:45 – 10:15	Alternatives for measuring heat production: D₂O and ¹³CO₂ <i>Cornelia Metges, FBN, GE</i>
10:30 – 11:15	Practical building of respiration chamber <i>Melissa Terranova, ETH Zurich, CH</i> <i>Sergej Amelchenka, ETH Zurich, CH</i>
11:15 – 12:00	Application 1: Calorimetry on animals Duration of measurement, (behavioural) adaptation and activity measurement – emphasis on companion animals <i>Kate Shoveller, University of Guelph, CA</i>
12:15 – 13:00	Application 2: Measuring methane Measurement of methane emissions in different systems. <i>Chris Reynolds, University of Reading, UK</i>
13:00 – 14:00	Lunch
14:00 – 16:00	Calculating heat production and energy balance and recovery test results Computer practical with the objective of dealing with the steps from measuring gas concentrations, air flow, etc. into a complete energy balance; Important calibration steps of the calorimetry system will be dealt with. <i>Marcel Heetkamp, Wageningen UR, NL</i> <i>Walter Gerrits, Wageningen UR, NL</i> <i>Etienne Labussière, INRAE, FR</i>

16:00 – 17:00	<p>Modeling of heat production</p> <p>Discussing various approaches of partitioning of heat production into the components like the thermic effect of feeding, basal metabolic rate and activity related heat production. Three approaches will be illustrated using the same dataset. Differences, pro's and con's will be discussed.</p> <p><i>Etienne Labussière, INRAE, FR</i> <i>Walter Gerrits, Wageningen UR, NL</i></p>
17:00	<p>Closure</p>

Lecturers

Sergej Amalchenka, PhD, Department of Environmental Systems Science, ETH Zurich, CH
Walter Gerrits, PhD, Professor in Animal Nutrition, Wageningen University, NL
Marcel Heetkamp, Senior Technician Calorimetry, Wageningen University, NL
Björn Kuhla, Head of Nutritional Biochemistry Group, FBN Dummerstorf, GE
Etienne Labussière, PhD, Senior Researcher INRAE, Rennes, FR
Cornelia Metges, PhD, Professor Biochemistry and head Nutritional Physiology FBN, GE
Manfred Mielenz, PhD, Senior Scientist Nutritional Physiology, FBN, GE
Jaap van Milgen, PhD, Senior Researcher INRAE, Rennes, FR
Chris Reynolds, PhD, Professor of Animal & Dairy Science, University of Reading, UK
Kate Shoveller, PhD, Professor, Dept of Animal Biosciences, University of Guelph, CA
Melissa Terranova, PhD, Department of Environmental Systems Science, ETH Zurich, CH

Course leaders

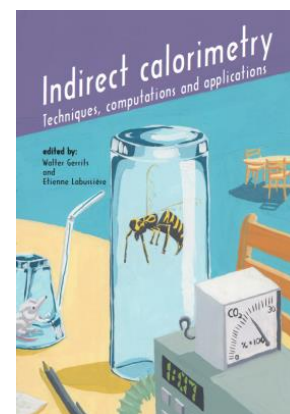
Walter Gerrits & Etienne Labussière

Local organization

Bjorn Kuhla & Cornelia Metges

Registration form

Course on indirect calorimetry 2025



Submit before the registration deadline May 30, 2025

Name (first & last)	
Address	
Zip code	
Country	
Email	
Phone (preferably where we can reach you around the start of the course if needed)	
Job details	
PhD student or post-doc	Yes / No
Experience (please elaborate, we will use this to adjust the course contents)	
What do you expect to learn during the course	

Please complete this form and Email it to: yvonne.vanholland@wur.nl.

You will receive a confirmation of receipt of your registration. Please note the course will be cancelled if the number of participants does not exceed 15 (by May 30). In this case, you will be informed before June 15. Payment of the registration fee is due on June 31st. You will receive payment details after registration. Do not hesitate to contact walter.gerrits@wur.nl in case of questions.