załącznik nr 2 do uchwały Rady Szkoły Doktorskiej UPP nr 1/P/2023

SYLLABUS – PULS Doctoral School

Name of the course (as specified in the approved program): **Animal production part 1.**	
Name of the course in Polish: **Produkcja zwierzęca część 1.**	
Unit providing the course (Department): **Department of Animal Nutrition**	
Course leader: **Prof. dr hab. Adam Cieslak**	
Discipline: **Animal science and fisheries**	Semester: **2**

TYPE OF CLASSES:
(course load)

- Lectures	**5**
- Practical classes	**7**
- Self-study	**10**
Total number of hours:	**22**

OBJECTIVE OF THE COURSE:

Present the current state of knowledge regarding the latest trends and procedures in nutritional and genetic methods aimed at reducing the negative impact of animal production on the environment.
Familiarization with the practical application of methane measurement methods and animal welfare verification procedures.
Identification of characteristics related to animal neglect and welfare concerns.

TEACHING METHODS:

Multimedia presentations
Journal club – selecting data for
discussion Analysis of case studies
Respiratory chambers experiments
Completion of animal welfare protocols based on visual materials

EDUCATION OUTCOMES*	Reference to education outcomes of the PULS Doctoral School
In the area of knowledge (PhD students know and understand): 1) The global scientific literature on nutrition, environmental impact, and welfare, including the implications for practical applications in nutrition, genetics, welfare, and environmental sustainability 2) The latest theories and trends in nutrition, genetics, and welfare research, as well as their scientific interpretation	P8U_W_1 P8U_W_2
In the area of skills (PhD students know how to): 3) Apply knowledge creatively in the formulation of their research problems. 4) Innovatively solve research tasks using independently acquired knowledge of state-of-the-art methods and research tools.	P8U_U_1 P8U_U_2
In the area of social competencies (PhD students are capable to): 5) Independently plan research and disseminate findings within the existing body of scientific literature. 6) Promote effective teamwork models. 7) Uphold and advocate for the importance and role of the intellectual community in social life.	P8U_K_1 P8U_K_4 P8U_K_5

Methods of evaluation of outcomes achievement:

Written test (theoretical knowledge): effects no 1, 2, 5
Projects (practical knowledge): effects no 3,4,5,6,7

* efekty uczenia się stanowią Załącznik nr 1 do Regulaminu Szkoły Doktorskiej Uniwersytetu Przyrodniczego w Poznaniu, który stanowi załącznik do uchwały nr 44/2021 Senatu UPP

TEACHING CONTENT:

- Review of current topics in nutritional and genetic methods, as well as welfare verification, aimed at reducing the negative impact of animal production on the environment.
- Methane measurement methods (e.g., gas chromatography, respiratory chambers).
- Breeding programs and key animal breeding concepts focused on reducing animal production's environmental impact.
- Current methods for verifying animal welfare.

The course completion criteria and methods:	Percent of a final grade:
Form: Assessment	
Lecture:	50%
Written test (lectures)	50%
Exercises:	
Written transcript from practical sessions	
Criteria	
• Attendance: at least 80%	
• Active participation (participation in discussions, answering lecturer's questions)	
☒ **pass (Z)** ☐ **course credit with a grade** ☐ **examination**	

RECOMMENDED LITERATURE:

1. Deitmers, J. H., Hartinger, T., Gresner, N., & Südekum, K. H. (2024). Comparison of ruminal fermentation characteristics of two common forages using a coupled in vivo-in situ approach and the in vitro rumen simulation technique RUSITEC. *Animal Feed Science and Technology*, 115900.
2. Larsen, M. L., Wang, M., & Norton, T. (2021). Information technologies for welfare monitoring in pigs and their relation to
   Welfare Quality®. *Sustainability*, *13*(2), 692.
3. Lassen, J., Difford, G.F. (2020). Review: Genetic and genomic selection as a methane mitigation strategy in dairy cattle. *Animal*, 14:S3, 473-483
4. Levrault, C. M., Difford, G. F., Steinheim, G., Koerkamp, P. W. G., & Ogink, N. W. (2023). Validation of the methane production measurement accuracy and ranking capacity of portable accumulation chambers for use with small ruminants. *Biosystems Engineering*, *236*, 201-211.
5. Ludwiczak, Agnieszka, Małgorzata Kasprowicz-Potocka, Anita Zaworska-Zakrzewska, Joanna Składanowska-Baryza, Vicente Rodriguez-Estevez, Santos Sanz-Fernandez, Cipriano Diaz-Gaona et al. "Husbandry practices associated with extensification in European pig production and their effects on pork quality." *Meat Science* (2023): 109339.
6. Marchewka, J., Sztandarski, P., Solka, M., Louton, H., Rath, K., Vogt, L., ... & Horbańczuk, J. O. (2023). Linking key husbandry
   factors to the intrinsic quality of broiler meat. *Poultry science*, *102*(2), 102384.
7. Meuwissen, T., Hayes, B., & Goddard, M. (2016). Genomic selection: A paradigm shift in animal breeding. *Animal Frontiers*, 6(1), 1-17
8. Patra, A. K., & Puchala, R. (2023). Methane mitigation in ruminants with structural analogs and other chemical compounds targeting archaeal methanogenesis pathways. *Biotechnology Advances*, 108268.
9. Sypniewski, M., Strabel, T., Cieslak, A., Szumacher-Strabel, M., & Pszczola, M. (2019). Interchangeability and comparison of methane measurements in dairy cows with 2 noninvasive infrared systems. *Journal of Dairy Science*, *102*(10), 9512-9517.
10. Web sites:
    - https://www.welfarequalitynetwork.net/en-us/home/
    - https://meatquality.eu/

* efekty uczenia się stanowią Załącznik nr 1 do Regulaminu Szkoły Doktorskiej Uniwersytetu Przyrodniczego w Poznaniu, który stanowi załącznik do uchwały nr 44/2021 Senatu UPP