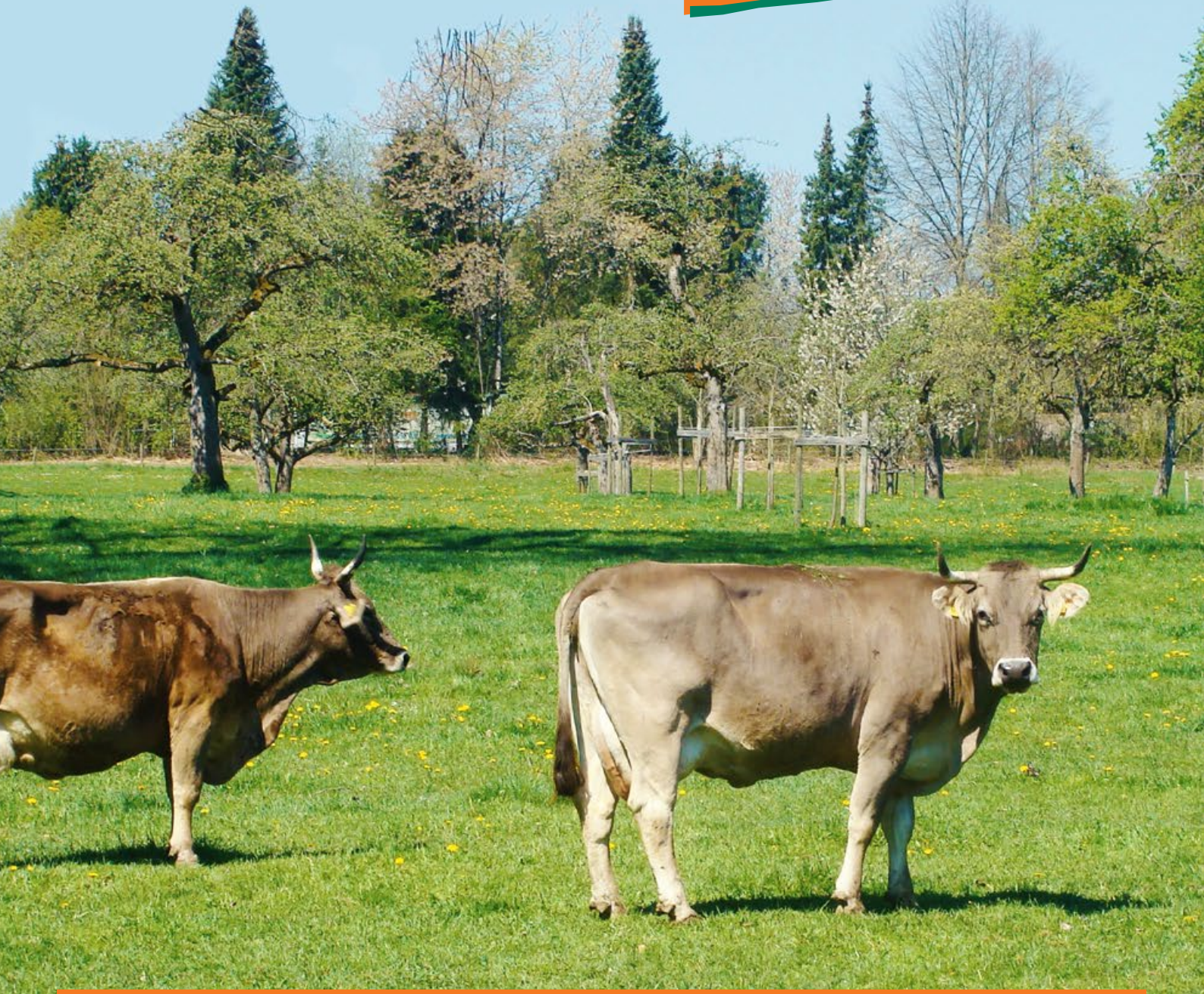
BIODYNAMIC FEDERATION demeter



BRIEFING PAPER

ANTIMICROBIAL RESISTANCE

Holistic Animal Husbandry Through Health and Welfare

Antimicrobial Resistance – The 'silent pandemic'

The World Health Organisation has declared Antimicrobial Resistance (AMR) as one of the top ten health threats facing humanity[1]: AMR is currently responsible for 700.000 deaths every year and has thus been coined the 'silent pandemic'.[2]

AMR is the consequence of the overuse and misuse of antibiotics and other antimicrobials. As microorganisms are increasingly exposed to antibiotics, they mutate to become resistant to the drugs which have in the past been effective.[3] Consequently, even minor injuries and small infections become untreatable and potentially lethal. This forces a shift to more expensive and broad-spectrum antibiotics, but also adds to the already high pressure to develop new antibiotics in a context of a scientific bottleneck.[4]

AMR and Industrial Livestock Systems

About 73 % of global sales of antimicrobials, including antibiotics, are applied in livestock.[5] The logic of the resulting problem is simple: the more antimicrobials are used on livestock, the higher the chances of AMR developing in animals, and subsequently in humans. Research shows a clear correlation between antibiotic use and antimicrobial resistance.[6] Shocking estimates state that for each kilogram of meat, humans consume up to 172 mg of antimicrobials with direct consequences of AMR transmission.[7] For instance, 35 % of chicken meat in supermarkets are contaminated with microorganisms that are resistant to key antibiotics.[8]

Industrial livestock production is responsible for much antibiotic use with a long history of reckless and poorly documented applications.[9] The routine over- and misuse of antibiotics is necessitated in large-scale, intensive agribusinesses. The following are some examples of common practices:

1. **Stressful living conditions for animals** (e. g., high stocking density or early weaning) lead to higher susceptibility to and less resistance against disease.[10]
2. **High animal density and overcrowding** is a tremendous risk factor for disease outbreak, making antibiotic applications more frequent.[11]
3. Antimicrobials are applied to achieve **growth promotion, feed efficiency, and improvement** of the animals. For example, 8 out of 10 milk cows receive reserve antibiotics because their high-performance bodies are reared in a way that they are constantly overtaxed and prone to painful udder inflammation.[12] Subsequently, studies have shown that 10 % of the milk are contaminated with AMR.[13]

Considering these issues, most peer-reviewed papers argue that we must limit the use of antibiotics in agriculture.[14] Biodynamic farming provides one way to proactively avert this 'silent pandemic'.

Biodynamics – Ensuring High Animal Welfare Standards

Biodynamic farming under the Demeter Certification Standards implements strict veterinary rules by[15]:

1. **Prohibiting the preventive usage of antibiotics** as enhancing additives to feed and water;
2. **Prohibiting the routine and/or prophylactic treatment of animals with antibiotics**, unless legally required (an exception to this is the use of permitted anthelmintics in those cases where parasitism is endemic in the area in which the farm is located);
3. **Aiming to be largely free of antibiotics**, except for emergencies to prevent animal suffering. If antibiotics are used, there is a maximum of three courses of treatment per year, depending on the animals' productive life span; they can only be applied under the direction of a veterinarian, with sufficient withdrawal times, and documentation in transparent farm records;
4. **Prohibiting the use of reserve antibiotics which are crucial for human medicine**;
5. **Pursuing evidence-based, complementary medicinal strategies**, such as essential oils, acupuncture, phytotherapy, and homeopathy that strengthen the self-healing capacities of the animal to cope with the disease without adverse risks[16].

Extensive research has repeatedly shown that the use of antibiotics, as well as the resulting prevalence of AMR, is considerably lower in organic farms compared to that measured in conventional farms.[17] For instance, the German Ministry for Consumer Protection and Food Safety found that the prevalence of AMR in conventional milk farms is almost 6 times that of organic farms.[18] The lower application of antibiotics also helps circumvent side effects from antibiotics that would require further pharmaceutical treatments.

Moreover, biodynamic farming practices apply health-oriented livestock management and high animal welfare standards from breeding and feeding to housing. Notably, animals are kept in a rich and stimulating environment where they can express their natural behaviours (e.g., no dehorning for cows) with low stocking density, ample space with access to nature, suitable flock or herd size, good air quality, and well-managed regrouping. Unlike in conventional breeding, farmers do not select the breed according to productivity and growth rates, which makes the animals vulnerable to immunological and physiological disorders. Instead, biodynamic farmers prefer local and adapted breeds that are more resilient and insusceptible against diseases.[19] Moreover, there is good feed with exhaustive control in residues (pesticides, herbicides, etc.) and high hygiene standards to avoid sources of microbial contaminations.

Extensive research findings[20] and reports from veterinarians[21] confirm the intuitive notion that better animal welfare and a less stressful environment leads to higher disease resistance, improved animal health and consequently lower antibiotic usage.[22] Combined with better animal welfare, low antibiotic use increases the balance of animals' immune activity, life expectancy, and life quality, at generally lower medicine costs.[23] In biodynamic farms, healthy rearing conditions, biosecurity, and hygiene are the focal point of veterinary treatment, rather than preventive or retroactive antibiotic medicine.

A much-needed paradigm shift in food production

The Federation works to promote health-oriented livestock systems that reduce the need for antibiotics in the first place. It aims at keeping AMR high on the political agenda, ensuring that decision makers, food producers, and the public are aware of and continuously discuss this urging problem.

The Demeter certification responds to the increasing demand for healthy and sustainable foods and recognizes the efforts of farmers that put animal welfare at the core of their practice and adhere to strict veterinary standards in a market environment that typically rewards efficiency and productivity.

Finally, the Federation urges policymakers to explicitly include high animal welfare and strict veterinary rules for the usage of antibiotics to effectively combat AMR. Decision-makers should embrace the much-needed paradigm shift in food production by:

- **Recognizing AMR as a problem** among other things triggered by industrial livestock systems;
- **Supporting the necessary paradigm shift** towards health- and welfare-oriented systems and encourage the dissemination of best practices;
- **Developing stricter regulations for veterinary antibiotic usage**, including preventive application, application limits, and mandatory reporting of antibiotic usage;
- **Developing stricter animal welfare standards**, for instance, through the prohibition of all mutilations, later weening, organic breeding, and better feed;
- **Subsidizing farms** that already have lower antibiotic applications and instead higher animal welfare;
- **Funding research** that addresses the connections between animal welfare, lower antibiotics usage, and reduced AMR for a better data-driven decision-making.

The Federation has always been and will continue to be a responsible steward on this topic, promoting and applying health- and welfare-oriented approaches that tackle this 'silent pandemic'.

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ABOUT US

The Biodynamic Federation Demeter International is a non-profit umbrella organisation and its member organisations work together as an international confederation relying on democratic principles. It is the only ecological association that has built up a network of individual certification for biodynamic farming organisations worldwide, the Demeter brand. Presently, the Federation has 45 member associations in 36 countries around the world. Thus, the Federation represents more than 5.400 Demeter certified farms with over 170.000 hectares in 65 countries. More info at: www.demeter.net

Literature & References

1 World Health Organization (November 17, 2021). *Antimicrobial resistance.* www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance.

2 European Parliament. (July 6, 2021). *Motion for a Resolution by Martin Häusling on the delegated regulation establishing the criteria for the designation of antimicrobials to be reserved for the treatment of certain infections in humans.* https://martin-haeusling.eu/images/210706_Draft_resolution_-_Objection_DA_on_antimicrobials_2021.pdf.

3 European Medicines Agency. (2021). *Reflection paper on antimicrobial resistance in the environment: considerations for current and future risk assessment of veterinary medicinal products.* www.ema.europa.eu/en/documents/scientific-guideline/reflection-paper-antimicrobial-resistance-environment-considerations-current-future-risk-assessment_en.pdf.

4 Davies, D. S. (2014). Antimicrobial resistance-why the irresponsible use of antibiotics in agriculture must stop. *World Health*, 1, 1–40.

5 Tiseo, K., Huber, L., Gilbert, M., Robinson, T. P., & Van Boeckel, T. P. (2020). *Global trends in antimicrobial use in food animals from 2017 to 2030.* Antibiotics, 9(12), 918.

6 Goossens, H., Ferech, M., Vander Stichele, R., Elseviers, M., & ESAC Project Group. (2005). Outpatient antibiotic use in Europe and association with resistance: a cross-national database study. *The Lancet*, 365(9459), 579–587.

7 Van Boeckel, T. P., Brower, C., Gilbert, M., Grenfell, B. T., Levin, S. A., Robinson, T. P., ... & Laxminarayan, R. (2015). Global trends in antimicrobial use in food animals. *Proceedings of the National Academy of Sciences*, 112(18), 5649–5654.

8 Deutsche Umwelthilfe. (n. d.). *Wenn Essen krank macht.* https://www.duh.de/themen/natur/naturvertraegliche-landnutzung/landwirtschaft/antibiotika-in-der-massentierhaltung (accessed December 2021).

9 Review on Antimicrobial Resistance. (2016). *Vaccines and Alternative Approaches: Reducing our Dependence on Antimicrobials* (Report). https://amr-review.org/sites/default/files/Vaccines%20and%20alternatives_v4_LR.pdf.

10 Behnassi, M., Shahid, A. & D'Silva, J. (2011). *Sustainable Agricultural Development: Recent Approaches in Resources Management and Environmentally-Balanced Production Enhancement.* (Eds.) Springer: London.; Sutherland, M. A., Niekamp, S. R., Rodriguez-Zas, S. L., & Salak-Johnson, J. L. (2006). Impacts of chronic stress and social status on various physiological and performance measures in pigs of different breeds. Journal of animal science, 84(3), 588–596.

11 European Medicines Agency. (2007). *Public Statement on The Use of (Flouro)quinolones in Food-Producing Animals In the European Union: Development of Resistance and Impact on Human and Animal Health.* https://www.ema.europa.eu/en/documents/public-statement/public-statement-use-fluoroquinolones-food-producing-animals-european-union-development-resistance_en.pdf.

12 Benning, R. (2016). Reserveantibiotika in der Milcherzeugung in Deutschland. *Weniger Hochleistung – eine Gesundheit für Alle. GermanWatch.* https://germanwatch.org/sites/default/files/publication/13987.pdf.

13 Deutsche Umwelthilfe. (n. d.). *Wenn Essen krank macht*. https://www.duh.de/themen/natur/naturvertraegliche-landnutzung/landwirtschaft/antibiotika-in-der-massentierhaltung/ (accessed December 2021).

14 Review in Antimicrobial Resistance. (2015). *Antimicrobials in agriculture and the Environment: Reducing Unnecessary Use and Waste* (Report). https://www.noah.co.uk/wp-content/uploads/2015/12/Antimicrobials-in-agriculture-and-the-environment-Reducing-unnecessary-use-and-waste.pdf.

15 Biodynamic Federation Demeter International. (2020). *Production, Processing and Labelling. International Standard for the use and certification of Demeter, Biodynamic and related trademarks*. https://www.demeter.net/wp-content/uploads/2021/04/20201204_bfdi_standard_for2021_final_sc.pdf.

16 Weiermayer, P., Frass, M., Peinbauer, T., & Ellinger, L. (2020). *Evidenzbasierte Veterinär-/Homöopathie und ihre mögliche Bedeutung für die Bekämpfung der Antibiotikaresistenzproblematik – ein Überblick*. Schweiz Arch Tierheilkd, 162(10), 597–615.; Baars, E. W., Zoen, E. B. V., Breitkreuz, T., Martin, D., Matthes, H., Schoen-Angerer, T. V., ... & Huber, R. (2019). The contribution of complementary and alternative medicine to reduce antibiotic use: a narrative review of health concepts, prevention, and treatment strategies. *Evidence-Based Complementary and Alternative Medicine*, 2019.; Reddy, P. R. K., Elghandour, M. M. M. Y., Salem, A. Z. M., Yasaswini, D., Reddy, P. P. R., Reddy, A. N., & Hyder, I. (2020). Plant secondary metabolites as feed additives in calves for antimicrobial stewardship. *Animal Feed Science and Technology*, 264, 114469.

17 Van Wagenberg, C. P. A., De Haas, Y., Hogeveen, H., Van Krimpen, M. M., Meuwissen, M. P. M., Van Middelaar, C. E., & Rodenburg, T. B. (2017). *Animal Board Invited Review: Comparing conventional and organic livestock production systems on different aspects of sustainability*. Animal, 11(10), 1839–1851.; Schwaiger, K., Schmied, E. M., & Bauer, J. (2010). Comparative analysis on antibiotic resistance characteristics of Listeria spp. and Enterococcus spp. isolated from laying hens and eggs in conventional and organic keeping systems in Bavaria, Germany. *Zoonoses and public health*, 57(3), 171–180.; Moon, D. C., Jeong, S. K., Hyun, B. H., & Lim, S. K. (2019). Prevalence and characteristics of methicillin-resistant Staphylococcus aureus isolates in pigs and pig farmers in Korea. *Foodborne pathogens and disease*, 16(4), 256–261.

18 Bundesamt für Verbraucherschutz und Lebensmittelsicherheit. (2016). *Ökologisch erzeugte Rohmilch enthält weniger antibiotikaresistente Keime als konventionell hergestellte*. https://www.bvl.bund.de/SharedDocs/Pressemitteilungen/01_lebensmittel/2016/2016_03_17_PI_Zoonosen.html?nn=11019972.

19 Ökologische Zierzucht. (n. d.). *Ziele der ÖTZ*. https://www.oekotierzucht.de/ueber-uns/ziele (accessed December 7, 2021).

20 Österberg, J., Wingstrand, A., Nygaard Jensen, A., Kerouanton, A., Cibin, V., Barco, L., ... & Bengtsson, B. (2016). Antibiotic resistance in Escherichia coli from pigs in organic and conventional farming in four European countries. PloS one, 11(6), e0157049. Blaha, T. (n. d.). *Antibiotikaeinsatz in der Tiermedizin*. Stiftung Tierärztliche Hochschule Hannover; Außenstelle für Epidemiologie. https://www.bvl.bund.de/SharedDocs/Downloads/10_Veranstaltungen/antibiotika_symposium_vortrag_blaha.pdf?__blob=publicationFile&v=3 (accessed December 2021).

21 Burgin, R. (November 18, 2016). EU vet calls for data driven animal health care. *Pig Progress*. https://www.pigprogress.net/Health/Articles/2016/11/EU-vet-calls-for-data-driven-animal-health-care-2920881W.

22 Bella-Paul, L. A. (2018). *Untersuchungen zur Tiergesundheit auf einem ökologisch geführten Milchviehbetrieb unter besonderer Berücksichtigung der Anwendungsmöglichkeiten der Homöopathie* (Doctoral dissertation). https://refubium.fu-berlin.de/bitstream/handle/fub188/3314/BellaPaul_online.pdf?sequence=1&isAllowed=y.

23 Silva, L. C. M., Madureira, A. P.,& da Costa, M. (2007). *Mais carinho no manejo de bezerros leiteiros: uma experiência bem sucedida.* Reuniao Anual da Sociedade Brasileirea de Zootecnia. http://www.grupoetco.org.br/arquivos_br/pdf/sbz_2007_bezerros_leite.pdf; Bella-Paul, L. A. (2018). *Untersuchungen zur Tiergesundheit auf einem ökologisch geführten Milchviehbetrieb unter besonderer Berücksichtigung der Anwendungsmöglichkeiten der Homöopathie* (Doctoral dissertation). https://refubium.fu-berlin.de/bitstream/handle/fub188/3314/BellaPaul_online.pdf?sequence=1&isAllowed=y.