Monogastric Feed Formulation Database (MAFFD.com), an Open-Access Online Resource to Support Sustainable Feed Formulation

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The swine and poultry sectors face increasing pressure to improve production efficiency and sustainability. Precision feed formulation can help improve the cost-effectiveness and sustainability of these industries. It hinges on having reliable nutritional specifications and comprehensive and accurate data on the composition and nutritive value of ingredients.

Authoritative reference sources, such as the NRC (2012), with nutritional specifications are not necessarily updated on a regular basis and do not always reflect scientific progress and advances in genetics in a timely fashion needed by the industry. Nutritional specifications are also computed using models that are occasionally complicated for most users to master.

Information on the chemical composition and nutritive value of feed ingredients is also disparate, incomplete and difficult to compute or reconcile across sources. The continuous introduction of novel ingredients, additives, premixes and solutions from different suppliers makes the maintenance of comprehensive feed ingredient databases a complex and time-consuming task.

The Monogastric Animal Feed Formulation Database (MAFFD) was developed to address many of these challenges. It is an open-access (free) centralized digital platform that aims to become an objective and reliable resource that meets the evolving needs of animal feed manufacturers and other animal industry stakeholders, educators and technical advisors.

MAFFD builds on the success of the International Aquaculture Feed Formulation Database (IAFFD), a free online resource developed in Ontario that has been widely adopted by the global aquaculture industry. Like the IAFFD, the MAFFD is comprised of a suite of complementary sub-databases, including the Feed Ingredient Composition Database (FICD), Animal Nutritional Specifications Database (ASNS) and Practical Feed Formulation Database (PFFD). Nutritional specifications in the ASNS were developed using an advanced factorial modelling approach that estimates optimal nutrient specifications as a function of genotype, production phase, body weight, growth potential, and production objectives. The ASNS v 2.0 currently includes nutritional specifications for different types and genetic strains of swine and poultry. The FICD v 2.0 contains comprehensive nutritional composition data for more than 200 feed ingredients, covering proximate composition, individual nutrients, standardized ileal digestibility (SIDs), energy values, antinutritional factors and contaminants, and eventually environmental footprint parameters.

The MAFFD is shared according to a "Creative Common Attribution-No Derivatives 4.0 International" license through its user-friendly online interface (MAFFD.com). All data contained in the database can be exported for free in a format designed for optimal compatibility with widely used least-cost feed formulation software, such as BestMix, Allix and Brill.

The development of the MAFFD is currently supported by USSEC (USSEC.org) and Wittaya Aqua (wittaya-aqua.ca). Plans are to continuously update it to include new research insights, novel ingredients, take into account genetic progress and adapt it to the needs and preferences of animal industry stakeholders. Opportunities exist to support the development of this valuable online tool and also expand its list of ingredients, additives and nutritional solutions.