National Swine Nutrition Guide

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Preface and Acknowledgements

Several universities publish applied swine feeding recommendations for their pork industry and producer clientele to use in making sound nutritional decisions. Usually the swine extension and research faculty at a given institution relies on several resources, including the Nutrient Requirements of Swine (NRC, 1998), research results, and their experience to develop the recommendations that are included in feeding guidelines. Considering there are fewer swine faculty at many institutions today and that the US Pork Center of Excellence (USPCE) was created to coordinate national extension, teaching and research efforts in the area of swine, it is logical for these two groups to embark on an effort to develop this National Swine Nutrition Guide (NSNG).

Also, swine nutrition and feeding management is a complex process. Feed is the largest single item among the costs of producing pork, historically accounting for about 60% of all costs in farrow-to-finish systems. Pork producers are encouraged to employ a comprehensive feeding program based on sound principles and tailored to their operation. The NSNG, which includes the Diet Formulation & Evaluation Software DVD to allow direct application of its contents to practical feeding situations, provides the basis for the development and management of such swine feeding programs.

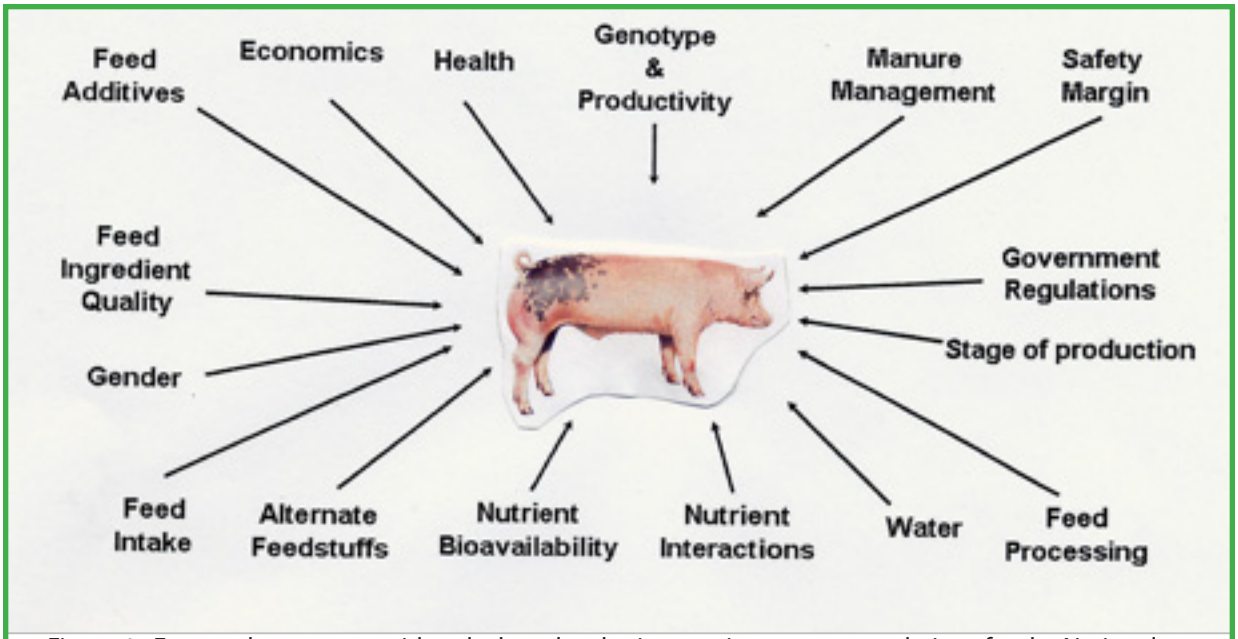

Figure 1. Factors that were considered when developing nutrient recommendations for the National Swine Nutrition Guide.

The purpose of the NSNG is to enhance the understanding of basic nutrition, feeding principles and related management practices and to serve as a reference for pork producers, students, educators and allied industry personnel. Users of the NSNG will be able to estimate the nutritional needs of pigs by considering specific factors that affect nutrient recommendations (Figure 1). The identification and description of the factors in Figure 1 provide the framework for the nutrient recommendations presented in the NSNG.

In order for the NSNG to be relevant and creditable, we were determined to involve several people representing various facets of the pork industry in order to gather current feeding recommendations as well as potential new trends in swine feeding management. Industry representatives were involved in the development of the NSNG in three ways.

In early 2007, 30 pork industry professionals were contacted personally to complete a 16-question survey. A total of 21 survey responses were returned (70% response rate) which represented commercial feed manufacturing companies, integrated production operations, genetic companies, independent feed manufacturers, and nutritional consultants. Respondents represented about 75% of U.S. pig production. Results indicated that the majority of the swine nutrition and feeding recommendations are similar across the industry.

In the nursery, the number of dietary phases used ranged from 2 to 6 with the majority (71%) implementing four dietary nursery phases from 12 to 50 lb. Entry weight ranged from 10 to 15 lb while exit weights ranged from 45 to 70 lb.

For the growing and finishing period, the number of dietary phases ranged from 4 to 14 with the majority (86%) implementing five or six dietary phases plus a ractopamine phase. Finisher exit or slaughter weights ranged from 260 to 290 lb.

For the sows, respondents were equally split between feeding parity 1 and parity 2+ females separate diets. The majority indicated that the same diet could be fed to females of all parities, but they often provided a soybean meal top dress to the parity 1 lactating female. However, if the farms/herds were segregated by parity then separate diets would be fed; otherwise, it was difficult to provide different diets according to parity.

For expression of dietary nutrient concentration, the majority of the respondents indicated using percentage of the diet or concentration relative to dietary energy. When expressing energy recommendations, metabolizable energy (ME) was preferred by 95% of respondents, but also many monitored net energy and that in the future net energy would be emphasized more. To establish amino acid requirements for use in diet formulation, 76% used the 1998 NRC and current literature or internal data. When expressing amino acid requirements for use in diet formulation, the results were more variable, with an equal split between total, apparent digestible, or standardized or true ileal digestible bases being used. When working with clients, those surveyed stated that when expressing nutrient concentrations for energy, ME is used 100% of the time, while for amino acid concentration, 86% use total amino acids and 76% use percent of the diet for expressing nutrient requirements.

Information and advice was also obtained from industry representatives by inviting them to participate in some of our meetings and to serve as factsheet reviewers. Through these efforts we believe we achieved our goal of utilizing the knowledge of respected swine professionals who represent a cross section of the pork industry to improve the application of this publication.

Nutrient requirements established by the 1998 National Research Council (NRC) as well as research results published since then were used as the basis for nutrient recommendations in the NSNG. However, users of the guide need to be aware that dietary formulations are driven by different sets of standards for many producers. Economics strongly drive most formulations; however, marketing may also be a factor. Health has a major limiting effect on performance in practical situations and needs to be accounted for in formulating diets. Other non-nutritional factors such as ingredient prices and availability, marketing contracts/packer grids, pig flow, and producer owned versus contract production come into the decision making process for the nutritionist and analyzing their effects correctly can have a major influence on profitable

diet formulation.

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