INTRODUCTION

One Page Feed Formulation (OPFF v1.1.xlsx)\*

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OPFF is a Microsoft Excel Workbook that is capable of solving feed formulation or feed mix problems. It may be useful for small producers or for teaching the basic principles of feed formulation.

OPFF runs on most Windows versions of Excel and recent versions on Apple Mac operating systems (although it runs rather slowly on Mac computers, it gives the same answers as Windows computers).

OPFF uses Excel with the Solver Add-In. The Solver Add-In comes with Excel but must be activated, or added in. Once you add it to your computer, it should always be there.

Feed formulation is the interface of biology and economics. Besides technical information, feed ingredient cost data is needed to complete the task.

One critical aspect of formulating feeds for poultry, swine, or any other species, is knowing the composition of the ingredients. Crops can be very different from one another based on the particular genetic variety grown and environmental differences like soil type, fertilizer rates, rainfall, planting and harvesting times, harvesting time and methods, processing (including drying) and storage. The minimum and maximum amounts of ingredients that are practical to feed must also be known.

Of course the better the information going in the formulation problem, the better will be the results coming out. Using average ingredient composition values from tables may be all that is practical, especially for small producers. At a minimum, ingredient moisture levels should be measured and accounted for in formulation models.

Another critical aspect of feed formulation is the nutrient requirements of the animals being fed. There are many sources of nutritional requirement recommendations. For “heritage” breeds, those that have not been genetically selected for rapid growth or egg production, general recommendations from older sources, like textbooks, or The Poultry Hub Australia web site, will probably suffice. For modern birds, highly selected for growth and meat production, or egg production, the breeding companies’ recommendations are probably best.

Cost information is also critical for feed formulation. Many feed recommendations are based on historical data. Such information is interesting but irrelevant. The important cost data is what ingredients cost today or what the costs are expected to be in the future. Prices are constantly changing and tools like Excel can be used several times per day when needed.

Historical price trends are useful in predicting what prices will be in the future. There have been yearly price cycles in crops. Grains tend to be the least expensive during and just after harvest time each year. Protein meals are similar but subject to more global influences. An oilseed crop failure in one part of the world may result in more oil production somewhere else. This results in an abnormally high supply of the by-product protein meal. While the price of oil may be increased, the protein meal’s price is actually depressed, at least temporarily.

Many small producers lack the expertise and equipment for feed formulation from scratch. Still, there may be applications where OPFF may be helpful. Many producers mix whole grains with their feeds. OPFF can be used to determine how much grain to add as the birds grow. Commercial starter feeds should be high in protein, low in energy and well-fortified with vitamins and minerals.

As birds grow, their requirements for practically all nutrients, except feed energy level, decrease. Locally produced grains are low in protein but high in energy and relatively inexpensive. Therefore, diluting starter feed with grains as the birds grow, is an economical way to utilize locally produced grains. To set up OPFF to determine how much grain to add, the starter feed is included as one ingredient, and the grain is the only other ingredient. Then the requirements for each age when new feed needs to be mixed are specified. Properly balanced feeds should result.

\*Based on: The Use of an Electronic Spreadsheet to Solve Linear and Non-Linear “Stochastic” Feed Formulation Problems. By Gene M. Pesti and Andrew F. Seila, 1999. Journal of Applied Poultry Research **8**, 110-121. ISSN 1056-6171