

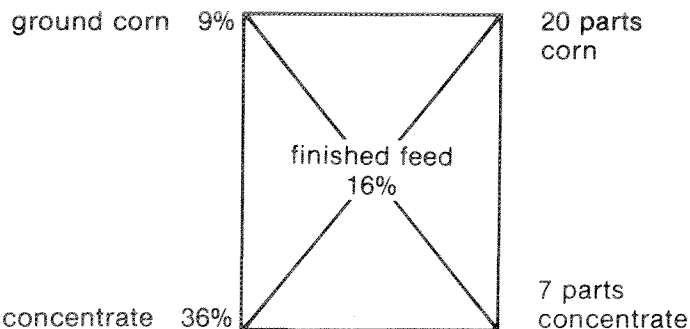
**Quick Facts**

- The proper ratio of grain to concentrate can be computed using "Pearsons' Square."
- Poultry feeding "free-choice" will balance their own diet if ingredients are available in proper quantities each day.
- Since feed may often account for 75 per cent of poultry production costs, feed should not be wasted.

"Pearsons' Square" method can be used to compute the proper ratio of grain to concentrate in a home mixing program. This procedure will help obtain a specific percent of protein in the completed ration as feed for poultry. To understand the "Pearson" method, the following example can be studied.

The desired protein content of the finished feed mixture (16%) should be placed in the center of a square, protein content of grain in the upper left-hand corner (9%) and the protein content of concentrate in the lower left-hand corner (36%). The next step is to subtract diagonally across the square to get parts of grain in the upper right-hand corner (20 parts) and parts of concentrate in the lower right-hand corner (7 parts). Now, the quantities 20 of corn and 7 of a 36-percent protein concentrate can be mixed and the finished feed mixture will have a nutritive value of 16-percent protein.

**Ingredient Protein (%)**



Many smaller poultry producers, and specifically backyard and hobby raisers of poultry will not want to take the time to regularly calculate and recalculate among the alternative (economical) choices of feedstuffs and use the above "Pearsons' Square" method. Poultry feeding free-choice will balance their own diet if the ingredients are available in the proper quantities on a per-daily basis.

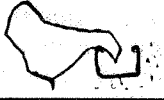
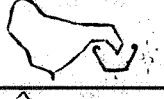
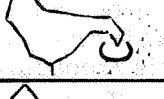

Therefore, a series of calculations have been made and a quick reference table developed that may be used to assist the poultry producer in preparation of feeding rations that will result in good and practical feeding levels. This procedure will not be scientifically accurate enough for use by commercial poultry producers, but it will take the guesswork out of the daily hand-feeding of scratch grains plus mash common for most small backyard flock situations.

Table 1 can be used to develop a feeding program as an example of how to feed day-old broiler or meat-type chickens.

- Step 1. Select two ingredients from Table 2, say "2" parts corn and "1" part wheat, thus the average percent protein of the grain supply in this example would be  $\frac{9+12.5}{3} = 10+$  percent.
- Step 2. Assume a 38-percent chick starter concentrate can be purchased locally, then
- Step 3. reading down the left margin of Table 1 to the section where 38-percent concentrate is listed,
- Step 4. since the previously selected grain supply will average slightly over 10 percent in protein value, locate 10 percent in column 2.
- Step 5. Broiler meat-type birds should be fed a ration of almost 20-24 percent; therefore, as one reads across left to right from 10 percent the value of 23.8 appears.
- Step 6. Now reading up the column from 23.8 it shows that the appropriate ratio of feeds to be provided would be in equal quantities (1:1 or 10 pounds concentrate to 10 pounds ground grain mixture).

<sup>1/</sup>H. L. Enos, CSU extension associate professor, poultry science (revised 8/1/79)

The procedure just worked through can be used for literally hundreds of feeding situations, choosing among different ingredients to feed different poultry flocks that may be encountered each for their own purpose. Since feed may often account for 75 percent of production costs, feed should not be wasted. Consider the factors illustrated below.

| Cross section of feeder trough (feeders never over 1/2 full)                      | Pounds of feed lost per hen per year |
|---|--------------------------------------|
|  | 4.2 pounds per hen wasted!           |
|  | 6.1 pounds per hen wasted!           |
|  | 12.8 pounds per hen wasted!          |
|  | 14.0 pounds per hen wasted!          |

**Table 1: Quick reference approximation values for free-choice feeding of concentrate and grain supplies.**

| Percent protein in available concentrate | Average percent protein in grain supply | If daily feeding ratio is (conc:grain) |       |      |      |
|--|---|--|-------|------|------|
|  |   | 0.25:1                                 | 0.5:1 | 1:1  | 2:1  |
| 22-23                                    | 9                                       | 11.7                                   | 13.5  | 15.8 | 18.0 |
|  | 10                                      | 12.5                                   | 14.2  | 16.3 | 18.3 |
|  | 11                                      | 13.3                                   | 14.8  | 16.8 | 18.7 |
|  | 12                                      | 14.1                                   | 15.5  | 17.3 | 19.0 |
| 27-28                                    | 9                                       | 12.7                                   | 15.2  | 18.3 | 21.3 |
|  | 10                                      | 13.5                                   | 15.8  | 18.8 | 21.7 |
|  | 11                                      | 14.3                                   | 16.5  | 19.3 | 22.0 |
|  | 12                                      | 15.1                                   | 17.2  | 19.8 | 22.3 |
| 32-33                                    | 9                                       | 13.7                                   | 16.8  | 20.8 | 24.7 |
|  | 10                                      | 14.5                                   | 17.5  | 21.3 | 25.0 |
|  | 11                                      | 15.3                                   | 18.2  | 21.8 | 25.3 |
|  | 12                                      | 16.1                                   | 18.8  | 22.3 | 25.7 |
| 37-38                                    | 9                                       | 14.7                                   | 18.5  | 23.3 | 28.0 |
|  | 10                                      | 15.5                                   | 19.2  | 23.8 | 28.3 |
|  | 11                                      | 16.3                                   | 19.8  | 24.3 | 28.7 |
|  | 12                                      | 17.1                                   | 20.5  | 24.8 | 29.0 |
| 44-45                                    | 9                                       | 16.1                                   | 20.8  | 26.8 | 32.7 |
|  | 10                                      | 16.9                                   | 21.5  | 27.3 | 33.0 |
|  | 11                                      | 17.7                                   | 22.2  | 27.8 | 33.3 |
|  | 12                                      | 18.5                                   | 22.8  | 28.3 | 33.7 |

**Table 2: Available ingredient and its probable percent protein.<sup>1</sup>**

|        |      |
|--------|------|
| Barley | 12.0 |
| Corn   | 9.0  |
| Milo   | 9.0  |
| Oats   | 12.0 |
| Rye    | 12.5 |
| Wheat  | 12.5 |

<sup>1</sup>These grains should be ground for maximum utilization rather than whole, or at least cracked, but not milled into fine flour.