

Formulation Methods to Produce Fish feed

Pearson Square Method

- Pearson square
- The simplest method to calculate the ration,
- It can be used for 2 and more ingredients,
- It can be balanced only one nutrient (make your choice for crude protein or crude fat)

Pearson Square

- Sample Calculation
- 1. Please calculate to prepare a fish feed that includes 45% crude protein, using fish meal and corn gluten meal...

Pearson Square

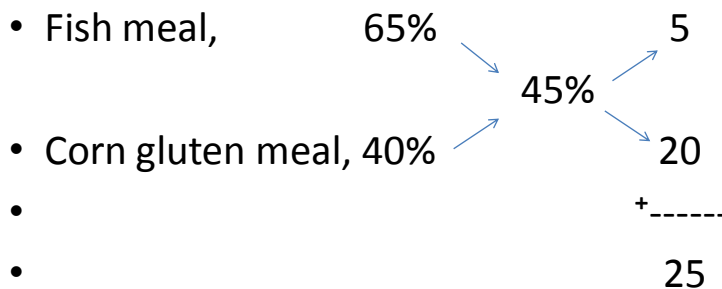
- 2. Always keep in mind the nutrient value of the ingredients...
- 3. Fish meal includes 65% crude protein,
- 4. Corn gluten meal includes 40% crude protein...

Pearson Square

- 5. What will be the solution to reach 45% crude protein using fish meal and corn gluten meal?
- You have 5 minutes to solve it...

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- 6. The solution is to create a mixture rip...



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- % of Fish meal is calculated as:
- $(5 \times 100) / 25 = 20$
- % of Corn gluten meal is calculated as:
- $(20 \times 100) / 25 = 80$

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- 7. The contribution from fish meal is:
- $20\% \times 65 = 13$
- The contribution from corn gluten meal is:
- $80\% \times 40 = 32$
- The total is; $13 + 32 = \underline{\mathbf{45}}$

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- What will we do if we have more than 2 ingredients?
- We have a solution...
- Sample: Please reach 40% crude protein using fish meal, corn gluten meal, wheat meal and soybean meal.

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- The crude protein % of ingredients:
- Fish meal: 65%
- Corn gluten meal: 38%
- Soybean meal: 42%
- Wheat meal: 17%

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- You have 5 minutes to create a solution...

Pearson Square

- The solution is to make two groups into the ingredients, the first should be consisted of ingredients whose crude protein % is higher than the requested and the second should be consisted of ingredients whose crude protein is lower than the request.

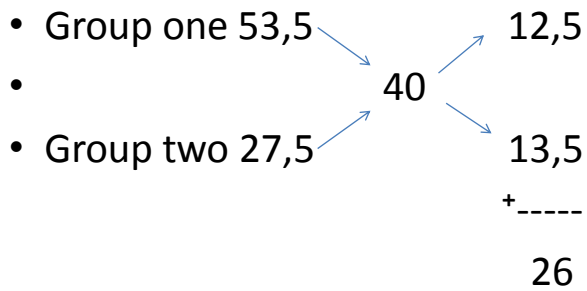
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- First group will be consisted of fish meal and soybean meal.
- Second group will be consisted of corn gluten meal and wheat meal.
- You should calculate the average crude protein % for first group and then you should do the same for second group.

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- First group average: $(65 + 42) / 2 = 53,5$
- Second group average: $(38 + 17) / 2 = 27,5$
- Now you should apply Pearson Square as if you have 2 ingredients that were called group one and group 2.

Pearson Square



Pearson Square

- % of group one: $(100 \times 12,5) / 26 = 48,07$
- % of group two: $(100 \times 13,5) / 26 = 51,92$

Pearson Square

- First group's ingredients %:
 - $48,07 / 2 = 24,035$
- Second group's ingredients %:
 - $51,92 / 2 = 25,96$

Pearson Square

- % of Fish meal: $65 \times 24,35\% = 15,83$
- % of Soybean meal: $42 \times 24,35\% = 10,23$
- % of Corn gluten meal: $38 \times 25,96\% = 9,86$
- % of Wheat meal: $17 \times 25,96\% = 4,41$
- **Total = 40,33**