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# 10 Frequently Asked Questions About Feed Formulation

*Answers to questions often asked by farmers interested in feed formulation*



**Author of the popular Feed Formulation Handbook/  
developer of the Excel-VB Ration Formulator at  
[www.iff.spontaneousdevelopment.com/wp/feed-formulation/](http://www.iff.spontaneousdevelopment.com/wp/feed-formulation/)**

Tayo K. Solagbade – [www.spontaneousdevelopment.com](http://www.spontaneousdevelopment.com)  
11/18/2013

++++**My comment:** Bello Hassan ([his picture appears in the software screenshot above - click to see](#)) has since purchased both my Feed Formulation Handbook and Software. He also impressed me greatly with his VERY enthusiastic efforts to use it, which helped me discover some "bugs"(errors) in the code for use in Excel 2007.

## After he got the handbook...

Date: Mon, 6 Jun 2011 17:27:04 -0700 (PDT)  
From: Bello Hassan  
Reply-To: Bello Hassan  
Subject: Re: Your Practical Livestock Feed Formulation Handbook (& Software)  
To: "Tayo K. Solagbade"

Hi Tayo,

I have seen that attachments and will go through. I have browsed the book and my initial impression is that you have succeeded in demistifying poultry feed formulation. I intend to post my full review of the book later through the link you gave.

However, I have the following questions:.... [read his questions & my answers here](#) +=+

Source: Tayo Solagbade's webmail inbox

**(Note : my answers – sent to him on Wed, June 8, 2011 10:53:46 AM – begin with >>>> inserted under each question)**

***IMPORTANT! The disclaimer contained in my Feed Formulation Handbook fully applies here: Responsibility for use of any and all information supplied below is strictly and solely that of the reader. The contents of this page are provided as information only. Your own judgment is required and encouraged.***

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**1. In the Northern part of Nigeria we dont have much of oyster shells and as such I have seen millers using 'limestone' is it a perfect substitute and what is its calcium and phosphorous contents?**

>>>>On page 15 of the handbook, you will find the first paragraph addresses your question fairly well as follows:

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Minerals enable skeletal tissue development and maintenance in poultry. They also make up a good proportion of the egg and help physiological functions.

Mineral sources that are available locally are oyster shell, seashells and limestone as sources of Calcium (Ca) while bone meal or defluorinated rock phosphate serve as sources of Phosphorous (P).

A gradual rise over the years in the price of bone meal has resulted from the reduction in the number of cattle slaughtered, and a consequent increase in bone consumption by humans – due to prices of meat rapidly becoming unaffordable to the majority of the population.

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**As for being a perfect substitute, that is subject to a number of considerations.**

But in my opinion, none worth dwelling on. The key nutrient required is Calcium. And Limestone has been found to be an acceptable substitute. This is a practical vocation – there will be constant efforts to explore new/better ways of meeting needed requirements.

**Note: The feed formulation handbook provides tables detailing % nutrient composition for Limestone and other feed ingredient.**

**2. Is there any difference between the CP requirement of layer on battery cages and those on deep litter because I read somewhere that layers on deep litter have more room for exercise to burn excess fat.**

>>>>Naturally, as with other animals – including humans – there will be a difference in CP requirement, but it will not be a massive one.

Also, there is really no direct relationship between fat and crude protein. Recall that proteins build muscles. The animal will convert proteins to flesh.

Fat builds up from consuming excess of energy giving foods like carbohydrate sources. Birds in cages would consume less food than those on litter.

\*\*\*\*\*See:

<http://www.medwelljournals.com/fulltext/?doi=javaa.2010.1739.1744>

**I also thought you might like to read this interesting page, which also describes the Pearson square computation technique – have not studied it though:**

<http://www.infonet-biovision.org/print/ct/274/livestockSpecies>

**And also check the other results i got via Google: <http://tinyurl.com/68mlgpc>**

**Note: The feed formulation handbook provides tables detailing % CP requirements for different groups of livestock under intensive farm production conditions.**

**3. Bone meal looks very dry, does it really have Pr+ contend of 22%?**

>>>>>I have addressed this in the corrected response I sent to you yesterday.

Like I said above, this is a practical thing. Bone meal does not have Pr+ content of 22% – and nowhere is that

stated in the handbook. Bone meal provides Calcium(approx 26%) and Phosphorus(approx 12%) in rations. As I advised in the manual, you may find it VERY helpful to do your own confirmatory analysis of certain ingredients you wish to use, so as to be sure of their real nutrient composition.

**Remember that the process of preparing ingredients could lead to mixing with other materials.**

For instance, there is a possibility of having meat(and/or blood) of some amount crushed with bone to get bone meal that one ends up using.

Since those added items contain significantly higher Pr+ than the bone, they could lead to THAT particular Bone Meal batch having relatively significant Pr+ content than normally obtains.

In this case, a laboratory analysis of that batch could reveal this, and possibly guide you better in doing your ration formulation computation.

**In the handbook, the examples used cannot be taken to represent what obtains CONSTANTLY in reality.**

Bone meal content in some instances is given as N/A (i.e. insignificant) and others as between 2 and 7 or more. As with every other thing in life, especially batch production processes, the truth is that ingredients composition will not be perfectly fixed.

Having said that, I would advise you err on the side of caution by analysing if possible. Most times, it would be safe to ignore ANY potential Pr+ contribution from Bone Meal – it's impact would be insignificant, given the low % contribution it makes to most rations.

#### **4. Is the Pr+ content of 'maize offal' 12 when maize itself has 9?**

**>>>> I am NOT familiar with the term "maize offal".**

Is there any such thing? Or did you assume the reference to "wheat offal" in the hand book means the same thing as "maize offal"?

Whatever be the case, Wheat offal is referred to in the handbook. And it is VERY different from Maize. Wheat is actually a superior cereal in terms of its nutrient composition – including Pr+ content. That's why even in beer brewing, wheat and malted barley are considered more relevant for high quality beer brewing worldwide than Maize, which tends to be used as an Adjunct.

Only Guinness Nigeria has successfully developed a technique of brewing internationally accepted high quality beer using Maize and Sorghum (which were traditionally regarded as inferior).

So, the "offal" is the outer covering of the wheat grain itself – and it does have relatively higher protein than Maize.

#### **5. Is there any difference between the Pr+ level of soya bean cake and full fat soya?**

**>>>>To be honest with you, I cannot say for certain. But there could (probably should) be.**

Feed mill operators/farmers who use them could also offer information you can use. A quick google search could help get an idea.

When I go online to send this to you, I'll post any relevant links I find below for you to check out:

Ok, found the following...

This page gives some infor on Pr+ content of Full fat soy bean:

[http://www.russoya.ru/e\\_prod24.htm](http://www.russoya.ru/e_prod24.htm)

**See also:**

<http://www.soymeal.org/sbmcomposition.html>

**This page gives useful infor on Pr+ content of soybean cake:**

<http://www.alibaba.com/showroom/soy-bean-cake.html>

Of course, the results obtained out there may differ from what we will get from OUR soybean – so you might want to keep that in mind.

You might want to explore other Google results I got:

<http://tinyurl.com/bellosoy>

## 6. How is palm oil added to poultry feed considering that it is liquid?

**>>>>It is just poured in along with the other ingredients.**

The experience of the feed miller and probably the preference of the farmer or ration formulator, would probably determine the stage at which the palm oil is added to ensure optimal mixing for even distribution, due to its liquid nature.

*It's again all very practical.*

## 7. Growers' ration should have CP content of 18-21% while Layers' ration 16-18% does it mean that growers' protein requirement is higher than that of layers?

**>>>>Growers, as the name implies are being raised to GROW.**

Proteins are the building blocks of the body – they are needed for growth. And the TIMING of the introduction of proteins for growers is VERY important (for) the success of that enterprise.

**Layers have a more gradually phased life.**

Their diet is often designed to ensure they achieve (and maintain) optimal body mass, PLUS so they have enough EXTRA to produce eggs of the right commercial

quality in large enough numbers for the larger part of their productive lives.

So, they would also need considerable amounts of protein, but since the farmer would NOT be aiming to GROW them for flesh alone, their protein consumption would tend to be generally lower than would be required for the growers.

Having said the above, I have noticed that these things are not cast in stone. The farmer, based on experience and other considerations (including new ideas) could adopt a variety of different Pr+ % content for his/her animals, using their resultant performance to decide whether or not to continue. No 2 farms are EVER the same.

## 8. what type of flavouring agent is used in poultry feed?

**>>>>I believe a variety exist – differing by trade names mainly.**

Vet shops (and feed mills operators) could offer useful ideas on which enjoy popular use. I could make enquiries for you, out here in Lagos (Agege has quite a number of places one can visit) – but I believe even at your end, you might be able to get some information too. If you look in the tables at the end of the handbook, you will see references to “grower’s vitamins” and “layer’s vitamins” – generic names used to refer to flavouring agents used.

## 9. what is the tolerable fat level in feed is it the same as crude protein requirement.

**>>>>Hmm, I'm not sure what you mean here.**

Measuring fat level in feed is not something I am aware of as a practice (out here). What is done is that we ensure we formulate rations with metabolisable energy



levels (Kcal/kg) that are appropriate for the animal's age or production group.

This way, excess energy from consuming the ration does not result in fat build up. *Maybe a visit to Google will yield some information.* Click <http://tinyurl.com/bellofat>

## 10. Foreign fish meal comes as either 65% or 75%. what is the protein content of local fish which looks like crumbs?

>>>>Good question. Takes me back to what I said earlier about erring on the side of caution by doing some analysis.

The materials used here sometimes are not produced to any specific standards. People just bring fish together and produce something with varying degrees of ground consistency – which has a “fishy” smell. To them, that makes it fish meal. **Others however exist that do a better job.** Again, this is a necessarily practical activity – one must go out and INVESTIGATE the sources. And of course, analyse what s/he is given. I would suggest,

going by what I have seen at this end, that you can safely assume local fish meal you referred to in your question would come with LOWER Pr+ content than the foreign counterparts.

That way, you'll play safe by having to use MORE to at least have your minimum % protein in your ration.

Then again, there is ALSO the issue of the quality of the local fish meal especially as it relates to mould growth, due to poor storage or preparation. Be sure to check this, else your compounded feed could end up poisoning your animals. If they don't die, you could suffer significant loss of productivity – which may be permanent!

### GET THE HANDBOOK/SOFTWARE

Click <http://tinyurl.com/ffhb-cbs> to learn how you can to get your ebook version of the feed formulation handbook. You will also learn how to order for the MS Excel-Visual Basic driven feed formulation software, and its PDF userguide. See videos on Youtube for my applications – to guide users:

<http://www.youtube.com/watch?v=khY2qD8adA4>

*+=+It is due to Bello's intelligent feedback/questioning that I now offer a Frequently Asked Questions page on Feed Formulation on my website. I called it "A Buyer's Recent Questions On Feed Formulation" - click [HERE](#).*

## After he got my answers...

Date: Thu, 9 Jun 2011 12:55:34 -0700 (PDT)  
From: Bello Hassan  
Reply-To: Bello Hassan  
Subject: Re: Answers to your questions...  
To: "Tayo K. Solagbade"

Hi Tayo,  
Thank you for your comprehensice respore. I found them quite satisfying.

**Tayo K. Solagbade** graduated as best student in Agricultural Extension Services from the University of Ibadan, in1992. He works as a multipreneur, with a bias for **Farm Research & Extension Advisory/Best Practice Services provision.**

Apart from a growing library of popular farm business articles, Tayo's **Feed Formulation Handbook**, and his customisable **Excel-VB driven Ration Formulator**, bring him in constant contact with farm business owners, feed manufacturers, policy makers and extension professionals in and out of Africa.

Among other services, he develops custom Excel-VB driven software (e.g. an **Excel-VB Driven Poultry Layers Farm Manager**) used in measuring Farm Key Performance Indicators for timely/accurate farm planning and decision making. See video demo at:

[www.spontaneousdevelopment.com/pfmgr.html](http://www.spontaneousdevelopment.com/pfmgr.html)