

# Guidebook

## Animal feed formulation tool

Species name

Stage physio

Formula

Price optimized : **219.03**

### RM profil

RM (Raw Material)	Min	MIX	Max	Variation	Price (/t)
00002 - Maize B	0	45.73	100	0	170
00003 - Soybean meal 48	0	16.68	100	0	330
00021 - Wheat bran	0	20.59	30		
00004 - Rice bran full fat	0	0	20		
00013 - Toasted soybean	0	15	15		
00031 - Salt (NaCl)	0	0	1		
00026 - Premix layer 2%	2,00	2	2,01		

[+] Add a RM

### Analyze

Nutrient	Min	MIX	Max	Variation
001 - Moisture	0	12.68	14	0
002 - Volume	100	100	100	0
201 - CP	20.5	20.5	22.5	0
203 - CF	0	4.99	5	0
207 - Fat	0	5.91	6	0
102 - AMEn (Poultry) (Kcal/kg)	2700	2700	2900	0

Formulate efficient feed at least cost

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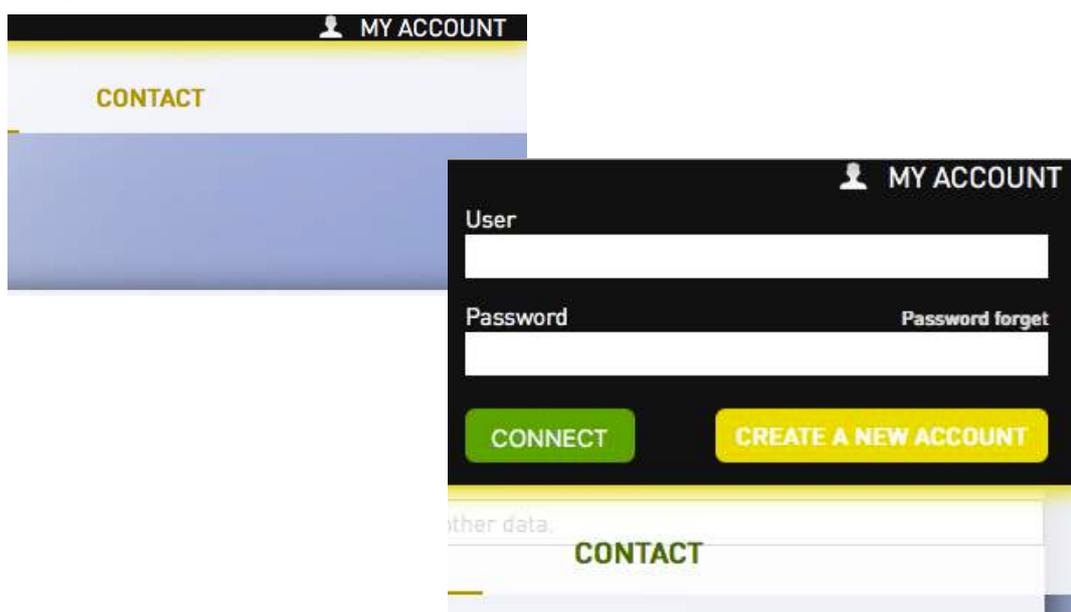
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## 1) Connection to your user account

FeedAccess website [www.feedaccess.com](http://www.feedaccess.com) offers a free formulation online service of animal nutrition. Only demo version is accessible until subscription. That version allows the user to discover the tool and get used to it but doesn't provide any access to all formulas, raw materials, and nutrients and features. User has to subscribe and accept the terms of use to do so.

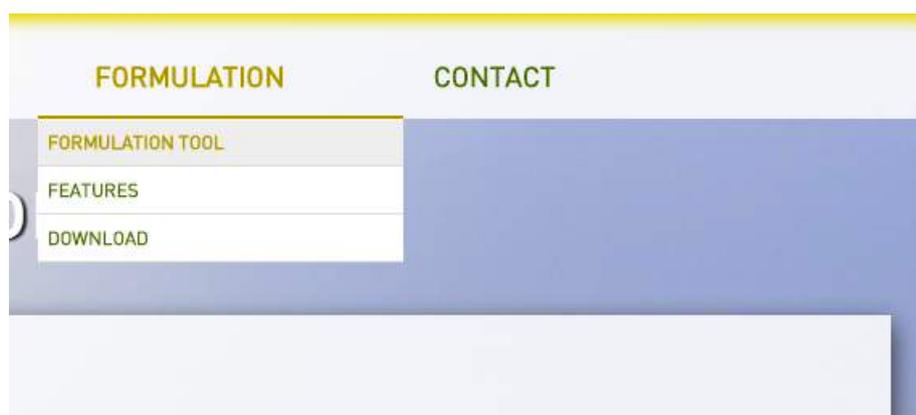
### 1.1) Connection

On every page of [www.feedaccess.com](http://www.feedaccess.com), you'll find a button at top right corner to connect to your account. Click on "My account", just fill the form with your login and password and click on "Connect".



### 1.2) Go to the formulation tool

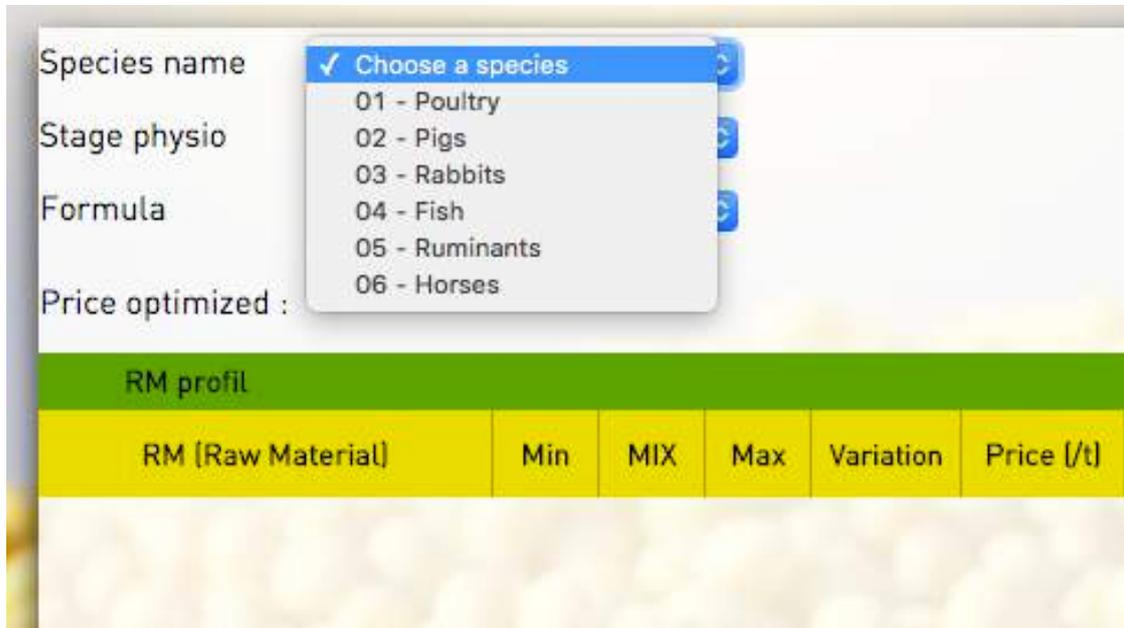
If you are already on the formulation tool page, you can start formulating. Otherwise go on the menu "Formulation", then click on the sub-menu "Formulation tool", and you'll be redirected to the appropriate page.



## 2) Settings for formulation

### 2.1) *Select a formula*

Select first a specie in the first drop-down list available. The choices in the following drop-down list will automatically be adapted.



Species name  Choose a species

Stage physio

Formula

Price optimized :

01 - Poultry

02 - Pigs

03 - Rabbits

04 - Fish

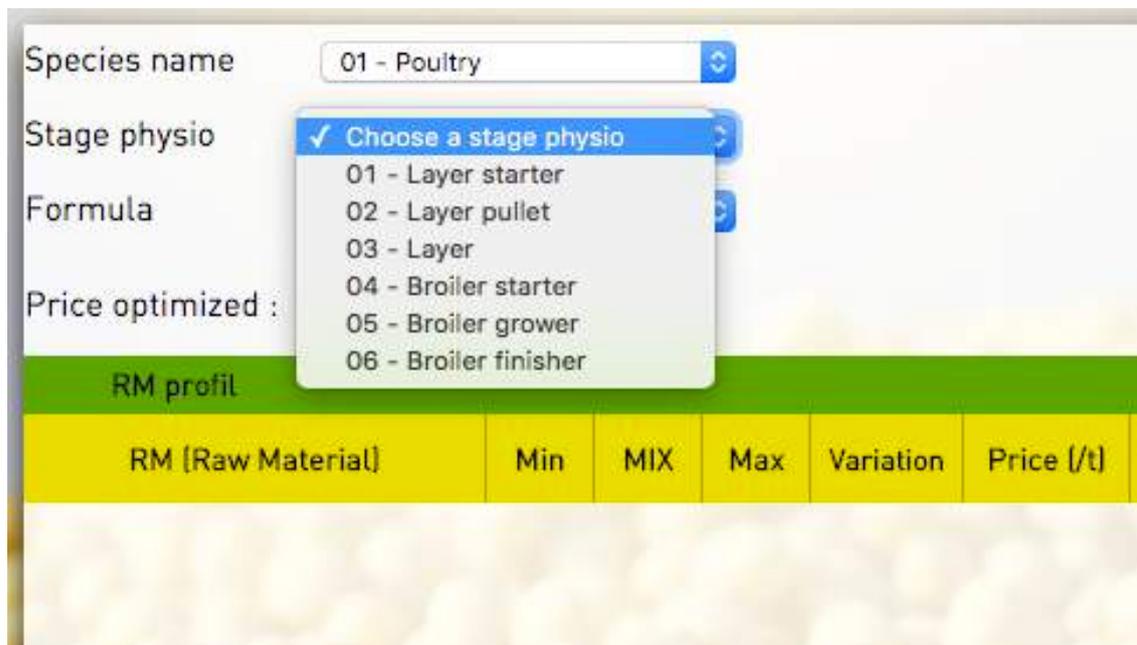
05 - Ruminants

06 - Horses

RM profil

RM (Raw Material)	Min	MIX	Max	Variation	Price [/t]
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Then select the physiological stage of the specie you want to formulate.



Species name

Stage physio  Choose a stage physio

Formula

Price optimized :

01 - Layer starter

02 - Layer pullet

03 - Layer

04 - Broiler starter

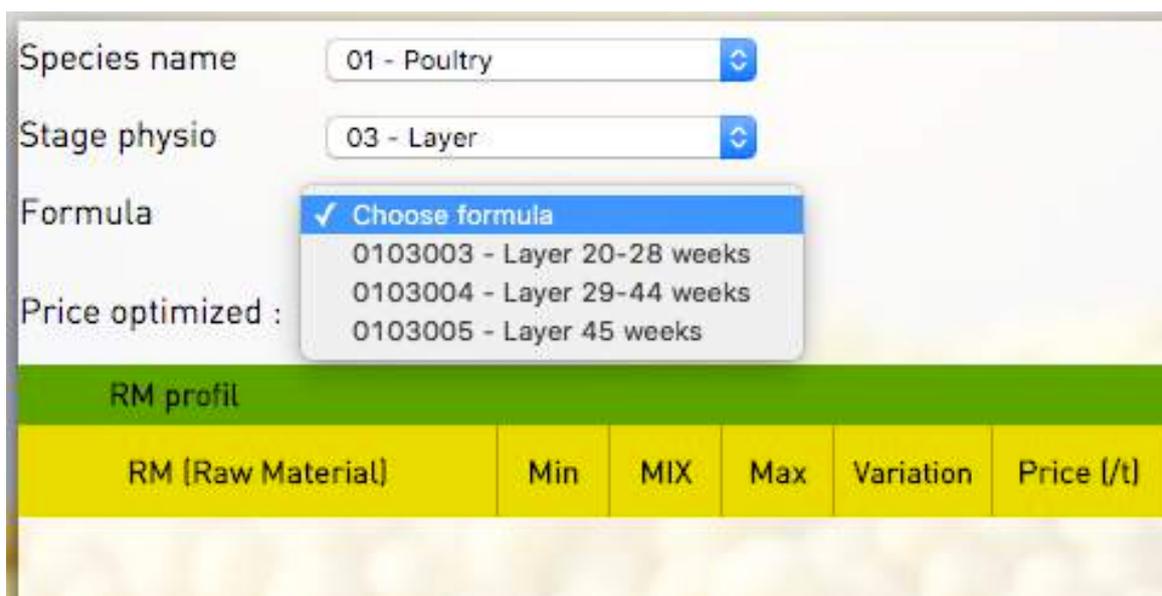
05 - Broiler grower

06 - Broiler finisher

RM profil

RM (Raw Material)	Min	MIX	Max	Variation	Price [/t]
-------------------	-----	-----	-----	-----------	------------

Eventually select the formula you want to formulate.



You have the possibility to select directly the formula from the last drop down list, and you can do the same for the physiological stage. As long as there are not too many formulas or physiological stages, this option is faster.

As soon as you select a formula, the nutritional constraints are updated automatically :



Analyze						
Nutrient	Min	MIX	Max	Variation	Constraint cost	Nutrient interval
Moisture (%)	0		14	0	0	
Volume (%)	100		100	0	0	
CP (%)	21		23	0	0	
CF (%)	0		5	0	0	
Fat (%)	0		6	0	0	

[+] Add a nutrient

If you have any doubt you can still click on the “Reset constraints” button that will set the default constraint values.

## 2.2) Select nutrients

Some nutrients appear by default as they are considered important for formulation and non-specific to a specie or a physiological stage. Other nutrients can be added, as energies which are specific to a specie or a physiological stage.

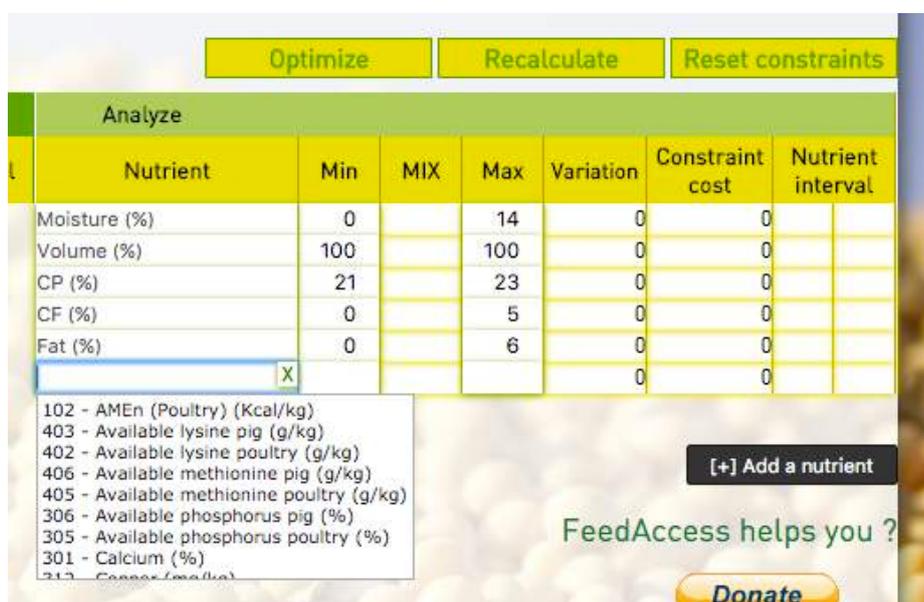
To add a nutrient, click on the button at the bottom right corner of the table : “Add a nutrient”. An empty row appears below nutrients already selected.



Optimize			Recalculate			Reset constraints		
Analyze								
Nutrient	Min	MIX	Max	Variation	Constraint cost	Nutrient interval		
Moisture (%)	0		14	0	0			
Volume (%)	100		100	0	0			
CP (%)	21		23	0	0			
CF (%)	0		5	0	0			
Fat (%)	0		6	0	0			
				0	0			

**[+] Add a nutrient**

Click inside the cell and the list of available nutrients will be displayed. Navigate inside the drop-down list, then select the nutrient your interested in and renew that procedure until you have selected all nutrients you want to formulate with. The nutritional constraints are automatically displayed.



Optimize			Recalculate			Reset constraints		
Analyze								
Nutrient	Min	MIX	Max	Variation	Constraint cost	Nutrient interval		
Moisture (%)	0		14	0	0			
Volume (%)	100		100	0	0			
CP (%)	21		23	0	0			
CF (%)	0		5	0	0			
Fat (%)	0		6	0	0			
				0	0			

- 102 - AMEn (Poultry) (Kcal/kg)
- 403 - Available lysine pig (g/kg)
- 402 - Available lysine poultry (g/kg)
- 406 - Available methionine pig (g/kg)
- 405 - Available methionine poultry (g/kg)
- 306 - Available phosphorus pig (%)
- 305 - Available phosphorus poultry (%)
- 301 - Calcium (%)

**[+] Add a nutrient**

FeedAccess helps you ?

**Donate**

### 2.3) Nutrients' constraints modification

Minimum and maximum constraints are set by default for each physiological stage, from scientific research data. It allows you to formulate safely animal feed for a specie at different production or growing stages. These min/max can be modified as soon as your technical level in formulation science allows you to analyze a particular situation or take more risks.

To modify a constraint, click on the cell you want to modify the value and enter the desired value instead of the other. You can also use the small arrows to increase or decrease the value. The optimization will take into account these values as a reference for the calculation of the mix. If you would like to set back the default values, just click on the “Reset constraints” button.

**Be careful**, if you click on the “Reset constraints” button, all constraints on raw materials will also be set back on the defaults values, and prices will be updated with prices saved in the selected price list.



Analyze						
Nutrient	Min	MIX	Max	Variation	Constraint cost	Nutrient interval
Moisture (%)	0		14	0	0	
Volume (%)	100		100	0	0	
CP (%)	21,5		23	0	0	
CF (%)	0		5	0	0	
Fat (%)	0		6	0	0	
AMEn (Poultry) (Kcal/kg)	2700		2900	0	0	

[+] Add a nutrient

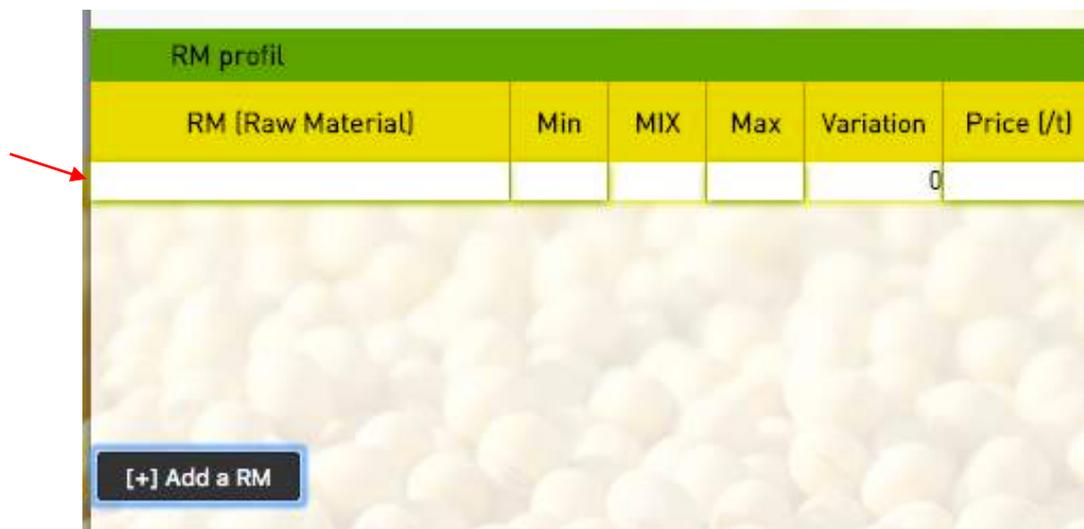
## 2.4) *Select raw materials*

To add a raw material (RM), click on the bottom left button of the table “Add a RM”.



RM profil					
RM [Raw Material]	Min	MIX	Max	Variation	Price [/t]
				0	

A row is displayed below the columns’ names in the “RM profil” part.



RM profil					
RM [Raw Material]	Min	MIX	Max	Variation	Price [/t]
				0	

Click in the cell to display the drop-down list with available raw materials. Do not hesitate to check the bottom of your page in order to have access to all available raw materials. Then select the raw material you want and repeat this procedure until you have selected all raw materials you need to formulate. Minimum and maximum constraints on raw materials are displayed automatically. If you have a doubt you can click on the “Reset constraints” button to display all default constraints. Anytime, you can delete a raw material ; to do so click on the cross in the cell where the raw material is displayed.

*Click on the cross to delete the row and the raw material*

RM profil					
RM (Raw Material)	Min	MIX	Max	Variation	Price (/t)
X					0

00002 - Maize B  
 00037 - Monocalcium phosphate (CaH(PO4)2, H2O)  
 00039 - Monocalcium phosphate (CaH(PO4)2, H2O & Ca  
 00035 - Oyster shell & coral  
 00022 - Palm kernel meal  
 00014 - Palm oil  
 00036 - Pig & sow premix  
 00030 - Premix broiler 2% finisher  
 00030 - Premix broiler 2% starter/finisher

*Drop-down list for raw material selection*

[+] Add a RM

### 2.5) *Modify constraints on raw materials*

Raw material min and max constraints are set by default from scientific research data. It allows you to formulate safely, and you can modify them as soon as your technical level in formulation science allows you to analyze a particular situation or take more risks.

To modify a constraint, click on the cell you want to modify the value and enter the desired value instead of the other. You can also use the small arrows to increase or decrease the value. The optimization will take into account these values as a reference for the calculation of the mix. If you would like to set back the default values, just click on the “Reset constraints” button.

**Be careful**, if you click on the “Reset constraints” button, all constraints on raw materials will also be set back on the defaults values, and prices will be updated with prices saved in the selected price list.

## 2.6) Modify raw material prices

When you've selected all the raw materials you want to formulate with, you need to check the prices (you have to !). Prices are calculated from international markets data and are not the prices you'll get your raw materials. To enter a price, use the small button in the price cell to increase or decrease the price or click inside the cell and enter the correct price manually instead of the old one.

We advise you to enter your prices in metric tons (mt). You can still enter it in the weight unit of your choice, the price of the mix will then be in the same unit and in the currency you would have chosen. The important is to always use the same units ! The application doesn't manage currency and unit conversions.

When all prices are correct, you can launch an optimization and get your perfect feed mix.

RM profil					
RM [Raw Material]	Min	MIX	Max	Variation	Price [/t]
Maize 8	0,00		100,0	0	161,03
Soybean meal 48	0,00		100,0	0	297,18
Wheat bran	0,00		30,00	0	36
Rice bran full fat	0,00		20,00	0	247,24
Toasted soybean	0,00		15,00	0	323,2
Salt (NaCl)	0,00		1,00	0	125
Premix layer 2%	2,00		2,01	0	1500

[+] Add a RM

RM profil					
RM [Raw Material]	Min	MIX	Max	Variation	Price [/t]
Maize 8	0,00		100,0	0	161,03
Soybean meal 48	0,00		100,0	0	297,18
Wheat bran	0,00		30,00	0	36
Rice bran full fat	0,00		20,00	0	247,24
Toasted soybean	0,00		15,00	0	323,2
Salt (NaCl)	0,00		1,00	0	125
Premix layer 2%	2,00		2,01	0	1500

[+] Add a RM

### 3) Formulate feed

#### 3.1) Launch an optimization

To launch an optimization, click on the « Optimization » button at the top right side of the table.

Species name:

Stage physio:

Formula:

Price optimized :



RM profil									Analyze
RM (Raw Material)	Min	MIX	Max	Variation	Price (/t)	Constraint cost	Value interval	Price interval	Nutrient
00002 - Maize B	0		100	0	170	0			001 - Moisture
00003 - Soybean meal 48	0		100	0	330	0			002 - Volume
00021 - Wheat bran	0		30	0	40	0			201 - CP
00004 - Rice bran full fat	0		20	0	250	0			203 - CF
00013 - Toasted soybean	0		15	0	320	0			207 - Fat
00031 - Salt (NaCl)	0		1	0	125	0			102 - AMEn (Poultry) (Kcal/kg)
00026 - Premix layer 2%	2,00		2,01	0	1500	0			

If nothing happens, and the columns “MIX” of the “RM profile” and the “Analysis” side remain null, the reason is probably because there is no solution possible with the raw materials selected and the constraints set as it is. Check first if all parameters are correct (minimum and maximum for raw materials and for nutrients, prices). A missing price or too restrictive constraints are often the cause of the problem : the tool cannot find a solution with the data provided. You can also check if no raw material has been forgotten, or add other raw materials. Then if this is not enough, delete some nutrients. If you get a result, then add the nutrients again one by one and optimize between each addition until you find which nutrient causes the problem. Widen its constraints until you get a result or formulate without it if possible.

### 3.2) Read the results

The results of the optimization are displayed in the columns “MIX” of the table :

- In the “RM profile” side, the column “MIX” displays the quantities (in percent %) of each raw material as the composition of the perfect feed mix.

Species name: 01 - Poultry  
 Stage physio: 03 - Layer  
 Formula: 0103003 - Layer 20-28 weeks

Price optimized : 219.03

*Price of the mix* (arrow pointing to 219.03)

*Composition (in %) of the feed mix* (arrow pointing to MIX column)

RM (Raw Material)	Min	MIX	Max	Variation	Price (/t)
00002 - Maize B	0	45.73	100	0	170
00003 - Soybean meal 4B	0	16.68	100	0	330
00021 - Wheat bran	0	20.59	30	0	40
00004 - Rice bran full fat	0	0	20	0	250
00013 - Toasted soybean	0	15	15	0	320
00031 - Salt (NaCl)	0	0	1	0	125
00026 - Premix layer 2%	2,00	2	2,01	0	1500

[+] Add a RM

- In the « Analysis » part, the column “MIX” displays the nutritional values that correspond to the feed mix (for the nutrient selected).
- The price of the mix is calculated automatically, and displayed in the same unit used for the raw material prices.

*Nutritional analysis of the mix*

Optimize Recalculate Res

Analyze

Nutrient	Min	MIX	Max	Variation
001 - Moisture	0	12.68	14	0
002 - Volume	100	100	100	0
201 - CP	20.5	20.5	22.5	0
203 - CF	0	4.99	5	0
207 - Fat	0	5.91	6	0
102 - AMEn (Poultry) (Kcal/kg)	2700	2700	2900	0

It is always possible to add a nutrient then click on the “Recalculate” button to read the value of that nutrient for the calculated mix.

*« Recalculate » button*

*Added nutrient which value has been calculated after clicking on the « Recalculate » button*

*Value calculated stresses a lack of calcium in the mix. A source of calcium should be added as a raw material in that example.*

		Optimize	Recalculate	Reset constraints			
Analyze							
al	Nutrient	Min	MIX	Max	Variation	Constraint cost	Value in
23	001 - Moisture	0	12.68	14	0	0	
28	002 - Volume	100	100	100	0	-2.21	90.76
02	201 - CP	20.5	20.5	22.5	0	6.89	18.92
	203 - CF	0	4.99	5	0	0	
28	207 - Fat	0	5.91	6	0	0	
	102 - AMEn (Poultry) (Kcal/kg)	2700	2699.99	2900	0	0.11	2697.41
	301 - Calcium (%)	2	0.14	3	0	0	

[+] Add a nutrient

Raw materials’ quantities can be modified manually, in order to get rounded values, easier to implement in a processing unit for example. To do so, click directly in the cell and change the value or click on the “pen” symbol that appears when your cursor pass over the cell that contains the quantity you want to modify. Then the value in the cell can then be modified manually. Click on the “Recalculate” button to get the correct analysis nutritional data.

Be careful : If you modify a value, the total volume of the mix won’t be 100% anymore. Make sure that value is 100% at the end otherwise your mix will not be correct.

Price optimized : 219.02

*« Pen » button that allows user to modify manually the quantity of a raw material in the mix.*

RM profil					
RM (Raw Material)	Min	MIX	Max	Variation	Price (/t)
00002 - Maize 8	0	45.73	100	0	170
00003 - Soybean meal 48	0	16.68	100	0	330
00021 - Wheat bran	0	20.59	30	0	40
00004 - Rice bran full fat	0	0	20	0	250
00013 - Toasted soybean	0	15	15	0	320
00031 - Salt (NaCl)	0	0	1	0	125
00026 - Premix layer 2%	2,00	2	2,01	0	1500

[+] Add a RM

If you decide to modify the constraints and launch a new optimization, you'll get the variations of quantities of each raw material compare to the previous optimization. They are displayed in the « Variation » column of the « RM profile » side. Variations of quantities for each nutrient selected will also be displayed in the "Variation" column of the "Analysis" side. These variations are calculated if you modify the mix manually. Negative variations are displayed in red and ahe a minus ("-") sign. They are useful to implement smooth transitions in animal feed.

Price optimized : 219.02

*Column that displays the variations of raw material quantities between 2 optimization*

RM profil					
RM (Raw Material)	Min	MIX	Max	Variation	Price (t)
00002 - Maize B	0	45.73	100	0	170
00003 - Soybean meal 48	0	16.68	100	0	330
00021 - Wheat bran	0	20.59	20	0	40
00004 - Rice bran full fat	0	0	20	0	250
00013 - Toasted soybean	0	15	15	0	320
00031 - Salt (NaCl)	0	0	1	0	125
00026 - Premix layer 2%	2,00	2	2,01	0	1500

[+] Add a RM

*Max constraints for the raw material that has been modified from 30 to 20%*

*Column that displays variations of nutritional values between 2 optimization*

Optimize Recalculate Reset constraints

Analyze								
	Nutrient	Min	MIX	Max	Variation	Constraint cost	Value interval	
41	001 - Moisture	0	12.21	14	-0.47	0		
16	002 - Volume	100	100	100	0	-2.21		
02	201 - CP	20.5	20.5	22.5	0	6.82	14.46	26.98
	203 - CF	0	4.23	5	-0.76	0		
34	207 - Fat	0	5.65	6	-0.26	0		
	102 - AMEn (Poultry) (Kcal/kg)	2700	2700	2900	0.01	0.11	2554.5	2852.55
72	301 - Calcium (%)	2	2	3	1.86	8.77	0.25	2.14

[+] Add a nutrient

### 3.3) *Prevent errors and solve a problem*

In order to avoid bad surprises, we advise you to implement modifications step by step, one at the time. This will allow you to detect what might cause a problem or prevent the possibility to get a result with an optimization. You'll be able to target the origin of a problem more quickly that way. You'll also see the direct impact of a modification of a constraint, a price, on the mix, and you'll better understand the interactions between raw material and nutrients and the constraints. It will be easier to step back if you make a modification with a negative impact in your mix. You'll learn faster how to formulate that way. Too many modifications and you will not remember every change and might loose time.

When you can't find a solution, try the following steps and you'll probably solve the problem. Otherwise do not hesitate to contact us and we'll try to find a solution together.

- Check if you haven't forgotten any raw material. It might happen, especially with raw materials such as sources of calcium or phosphorus, salt, or with premix if you formulate with amino acids or specific nutrients ;
- Check if constraints are correct : minimum and maximum on raw materials and nutrients. If you switch from a formula adapted to one specie to another one, some nutrients previously selected won't be adapted to the new formula and will block the optimization. Remove them and change for adapted ones. This is the case with energies for example ; a digestible energy for pig will not be adapted for poultry and you'll have to change it to formulate ;
- Check prices. Only one price missing can block the system from running properly;
- If you work with your own raw materials, check that all nutritional values have been well saved in database. If you formulate with a constraint on a nutrient but if the nutrient has a wrong value or no value for that nutrient, the tool might face difficulties to find a solution, and moreover if the tool find a solution it will probably be wrong ;
- Check that constraints are not too restrictive in the raw material context you've provided. This is the problem in many cases ; the tool cannot find a solution with the raw materials you've selected and the the constraints set. If you can, add some raw materials, even raw material you don't have but you maybe could get in future. You can also widen the constraints (decrease minimum and increase maximum). You can delete some nutrients until you get a result and add again these nutrient one by one to detect which one was a problem. Amino acids and micronutrients are often the ones that block an optimization ;
- If the problem occurs after one or several modifications, think about the "Reset constraints" button to set all default values (minimum, maximum and prices), you might have made a wrong modification without realizing it and you'll start from right basics ;
- Eventually, if none of the solution works, and before contacting us, try to reload the page. You might loose some work but there are great chances your problem will be solved.

### 3.4) Notions of formulation

Formulation is necessary to get technically performant feed at the lowest cost. The cost of feed can reach 75% of total costs in a farm. To lower the cost of feed as much as possible is part of the formulation and without that feature, we cannot really call it formulation.

Keep in mind when you formulate that formulation is just an approximation of the perfect mix and that whatever you implement you'll always be close to reality but not exactly "real". With samples taken from raw materials for analysis, analysis itself (which is an estimation of the true composition), the variability of composition of your raw materials, processing, you'll always be near perfect mix. Thanks to formulation, you get as close as possible to that perfect mix. As you know that, you'll be able to be more flexible with constraints and be able to solve a problem or take more risks and save more money and you'll make the difference on your financial performances.

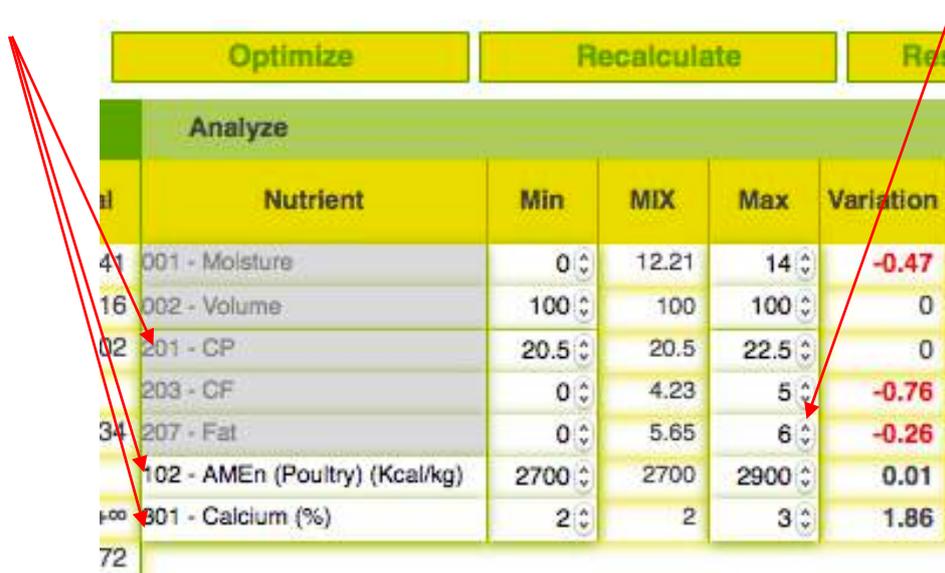
When you launch an optimization, and get a result, have a look first to nutritional values of the mix, and check if they reach their constraint (min or max). It is normal that some values reach their constraints, usually the lower ones. In many cases (but not all), when a value reaches its upper limit, it has a cost and this is not a normal situation. You have a risk of toxicity, unbalance ratios, or a risk that performances will decrease. In that case, try to add a raw material that will be able to solve the problem, providing less of that nutrient. A good knowledge of your raw materials is essential.

In some cases, you won't be able to get this value on its lower limit ; it can be the case when you use by-products, containing a lot of crude fibers for example, that are very cheap. As they are cheap, the raw materials will enter the mix as much as it is possible.

When the nutritional value reaches its lower limit, it is usually a normal situation and you should not modify the constraint to make it even lower. You would take a risk to decrease performances of the mix. This is also a sign that maybe the system hardly find the minimum nutrient requirements in the selection of raw materials available. Maybe you can find a raw material containing more of that nutrient to lower the cost of the mix.

*Examples of nutrient values that reach their lower limit*

*Example of nutrient values that is close to its upper limit*



Analyze		Min	MIX	Max	Variation
41	001 - Moisture	0	12.21	14	-0.47
16	002 - Volume	100	100	100	0
02	201 - CP	20.5	20.5	22.5	0
	203 - CF	0	4.23	5	-0.76
34	207 - Fat	0	5.65	6	-0.26
	102 - AMEn (Poultry) (Kcal/kg)	2700	2700	2900	0.01
100	301 - Calcium (%)	2	2	3	1.86

Then have a look to raw materials that could reach their mini or maxi constraint (lower or upper limit). If a raw material reach its lower limit, then you can conclude it is not interesting in the mix, at the price given, in the context you've established (the different raw materials available and their prices). It is rare to "force" a raw material in the mix by setting a minimum value, unless it is essential, as a premix or an additive, or required, as in a book of requirements for example. Sometimes, you'll have to do it to empty a stock faster and free space for a new delivery.

Ion the contrary, if a raw material reaches its upper limit ,it means it is very interesting for the mix. You'll be the one to decide if you can or not increase a little the limit to save some more money without taking risks, or if you need to lower that maximum to guaranty the quality of your mix. The knowledge of your raw materials and experience will make the difference.

And when no raw materials reach none of the limits, it simply means the mix is "free", and almost perfect !

### 3.5) *Go further*

If you're interested to learn more about formulation and read results, learn how to use constraint cost and data intervals given by the application, we can help you save more money and perform like professionals. Take part to our training program, go on our website [www.feedaccess.com](http://www.feedaccess.com) or contact us at [contact@feedaccess.com](mailto:contact@feedaccess.com) for more information.



**FeedAccess**  
OPTIMIZE ANIMAL NUTRITION