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NDS Dynamics

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Welcome to NDS Newsletter

By David Weber DVM

NOT ONE MORE NEWSLETTER TO READ YOU SAY!

NDS Dynamics would like to send you a newsletter quarterly to keep you up to date with changes in NDS and the industry. If this is something you are not interested in please send us an email to take you off our list.

Inside This Issue

Lipids Sub-model Update

By Ermanno Melli
Research & Development RUM&N Sas

Crude fat is normally determined by extraction using ether, but we know that not all ether soluble materials are fatty acids. Since fatty acids and glycerol are lipid compounds of nutritional significance, **NDS** includes the CPM lipid sub-model developed by Moate et al. (2004) that describes the ruminal digestion and metabolism of long-chain fatty acids (LCFA).
The lipid sub-model was developed to account for:

1. Intake of fatty acids;
2. Ruminal lipolysis of dietary lipids;
3. Ruminal biohydrogenation of fatty acids;
4. De novo synthesis of fatty acids in the rumen;
5. Effects of fat on rumen digestion and fermentation;
6. Intestinal digestion of fatty acids (Moate et al. 2004).

The evaluation experiments show that the lipid sub-model explained more than 86% of the variation between predicted and measured absorbed C12:0, C14:0, C16:0, C18:0, C18:1t, C18:1c, C18:2 and C18:3. These evaluations indicated that because the lipid sub-model accurately predicted the apparent absorption of total LCFA infused into the abomasum of dairy cows, appropriate intestinal absorption coefficients were used in the lipid sub-model. Furthermore, the model also accurately predicted the apparent absorption of total LCFA in the feeding experiments, suggesting that model may be correctly describe ruminal processes such as lipolysis, biohydrogenation and the de novo synthesis of LCFA that can influence apparent absorption of total LCFA.

Fatty Acids characterization update

Omega-3 Polyunsaturated Fatty Acids (*Omega-3 PUFA*), as essential fatty acids (EFAs), have become a hot topic in dairy cattle nutrition as new research and on-farm trials provide additional information on how critical EFAs are for the dairy cow and how they can impact each stage of the cow's lifecycle.
Fatty acids are the individual unit of measure for lipids and each has a distinct structure and function that influences the dairy cow's metabolism. *Omega-3 PUFA* cannot be produced by the cow using other available nutrients or chemical pathways. The only way *Omega-3 PUFA* can be supplied to the cow is through the diet and they can generate various positive effects.
The beneficial role of *Omega-3 PUFA* related to inflammatory diseases and health are well documented and feeding *Omega*-3 PUFA supplements to dairy cows could strengthen the immune systems of cows. Also, the supplementation with *Omega-3 PUFA* can improve

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Did you know the winner of the Indianapolis 500 is handed a bottle of milk?

Developments in NDS

By David Weber DVM
NDS-NA

There have been some additions made within your NDS program if you are looking for them; let me run them down for you.

1) With the new file management procedures in NDS you may now keep your recipes both "internally" within the NDS program and an "external" copy of those same recipes with a simple click of the mouse. This "external" copy of the recipe can be kept in the same style of "file structure" as within the NDS but it can be listed in any file name or easily created as "NDS Session Files" in your "My Documents" files. Also these can be easily emailed to your associates within the "external" file structure. Within this "external" file structure your PDF documents like you recipes, mixes or composites, batch sheets and even feeding sheets can be saved into that same farm file with one mouse click.

Please see the "File Structure_002_EN" PDF tutorial on the website for more information.

2) A moving average resampling has now been added into NDS. When you are downloading xml feeds that you have previously tested and entered into NDS you may choose an option to use a farm feed as the feed to be used as a template (that feed if imported as xml used a CNCPS feed on the first import). If this is done more than once for any one feed, you can choose "moving average" in the re-sampling section during the import of that feed. This will allow a simple, weighted or exponential average of that sample with previously sampled analysis of that same feed.

Please refer to "Importing your analysis in NDS using XML moving average resampling" PDF tutorial on the website for more information.

Please note:

If you are using the free antivirus program Avast! you may encounter problems with opening your NDS. If so please contact us and we will walk you through the problem. This has already been an issue we have seen a couple of times now.

Free Tips for your NDS!

Did you know:

- There are PDF tutorials in a zip file on our website!
- We even have some audio tutorials on the website that use your Windows Media Player to run through the tutorials.
- An easier way to get NDS Updates on your program; make sure the 'Automatic update' box is checked in the 'Options' under 'Settings.'
- A new commercial feed library is being built and is being made available for download now, with more ingredients added monthly!
- You can also pick where you want to save your recipes, in an external or internal file structure. To learn more visit "File Structure" tutorial from our website!

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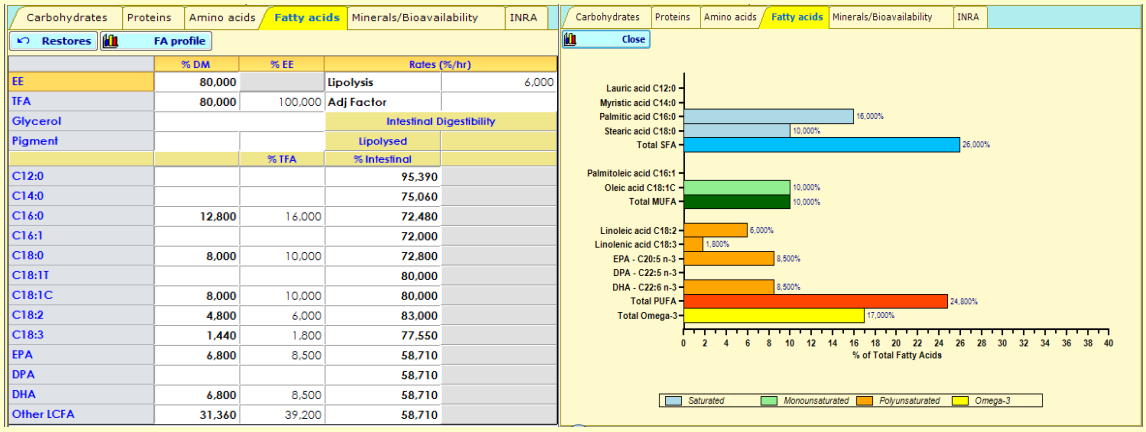
reproductive performance helping some specific reproductive functions like the production of specific hormones, especially progesterone, the production of prostaglandins in order to establish new estrous cycles and they promote integrity of the cow's cell walls.

Feed characterization

These considerations have led us to extend in **NDS** the feed characterization for fatty acids, introducing the very long chain n-3 fatty acids such EPA, DPA and DHA into the feed FA profile.

Through the ***Fatty acids*** tab it is now possible to characterize all feeds for EPA, DPA and DHA as well as for the other long-chain fatty acids, both as % EE and in terms of profile (% TFA). Also, in order to get a better representation of the FA profile for the feed, it is shown in a chart.



	% DM	% EE	Rates (%/hr)	
EE	80,000		Lipolysis	6,000
TFA	80,000	100,000	Adj Factor	
Glycerol			Intestinal Digestibility	
Pigment			Lipolysed	
		% TFA	% Intestinal	
C12:0			95,390	
C14:0			75,060	
C16:0	12,800	16,000	72,480	
C16:1			72,000	
C18:0	8,000	10,000	72,800	
C18:1T			80,000	
C18:1C	8,000	10,000	80,000	
C18:2	4,800	6,000	83,000	
C18:3	1,440	1,800	77,550	
EPA	6,800	8,500	58,710	
DPA			58,710	
DHA	6,800	8,500	58,710	
Other LCFA	31,360	39,200	58,710	

Diet evaluation

The proper feeds characterization for the extended FA profile, allows **NDS** to get an extended Fatty acids diet evaluation, including EPA, DPA and DHA (*Omega-3 PUFA)*, integrated into the ***NDS Lipids sub-model***.

Diet evaluation | Pool sizes | Rumen | Excretion | Fatty acids | Amino acids | Minerals | Vitamins | Reserves | Digestibility | Water

	Intake	Lipolysed	Duodenal	Absorbed	Fecal	Digested
	grams/day					% Duodenal
C12:0	2,03	1,59	2,03	1,94	0,09	95,39
C14:0	10,71	7,21	10,71	8,02	2,69	74,88
C16:0	232,28	106,55	249,49	194,00	55,49	77,76
C16:1	3,19	3,09	4,87	3,50	1,37	71,84
C18:0	40,92	18,08	403,11	298,81	104,30	74,13
C18:1T	0,30	0,29	47,80	38,23	9,57	79,99
C18:1C	190,10	102,49	107,23	93,03	14,21	86,75
C18:2	255,38	222,88	52,07	46,37	5,69	89,06
C18:3	90,74	85,65	6,48	5,26	1,22	81,15
EPA	16,15	4,58	13,86	8,14	5,72	58,71
DPA	0,00	0,00	0,00	0,00	0,00	0,00
DHA	16,15	4,58	13,86	8,14	5,72	58,71
Other LCFA	86,03	31,48	114,14	89,37	24,77	78,30
Ration	943,98	588,46	1.025,65	794,80	230,85	77,49
RUFAL	536,5 (2,39 %DM)		Total UFA	539,7 (2,40 %DM)		

Also, fatty acids intake (g/day) is presented graphically to better help the understanding of fatty acids nutrition.