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NDS Dynamics

NDS Multitasking Recipes Manager

By RUM&N Staff

By definition, the word **multitasking** describes a concept of performing multiple tasks (processes) over a certain period of time by executing them concurrently. New tasks start and interrupt already started ones before they have reached completion, instead of executing the tasks sequentially so each started task needs to reach its end before a new one is started. As a result, one executes segments of multiple tasks in an interleaved manner, while the tasks share common processing resources.

Multitasking does not necessarily mean that multiple tasks are executing at exactly the same time (simultaneously), but it imply some level of parallel execution. In other words, it does mean that more than one task can be part-way through execution at the same time, and that more than one task is advancing over a given period of time.

Applying to ration formulation the concepts described above, with the aim of providing new operational procedures, the development group at RUM&N, designed a new and alternative approach to recipe formulation called **Multitasking Recipes Manager**.

The tool is designed to actively compare, side by side, several versions of a given recipe formulated for a specific animal type. From a functional standpoint, every time you change something relate to feed type, feed amounts, feed costs or animal type (animal inputs, activity, environment) for a specific version, the system runs all the calculations and the outputs of that specific version will be updated, while the other versions will remain unchanged. Through this approach, it is possible to dynamically compare, in a single screen, what impact specific inputs may have compared to others, dramatically increasing productivity and the decision-making process of the formulation.

91	UULTITASKIN	IG RECIPE MANAGER	 <recipe 0<="" li=""> </recipe>	NCPS 6.55	> (Lactatii	ng Dair	ry Cowj : Hig	gn VL 10_2	016																		D /	
	Feeds (15)				Ver	sion 1			Ve	rsion 2			Ver	sion 3			Ver	rsion 4			Ver	sion 5			Ve	rsion 6		^
-	Corn silag	ge 32.4432 NF=15_027	7		47,968		15,431		47,968		15,431		49,736		16,000		47,968		15,431		47,968		15,431		47,968		15,431	
3	Alfalfa hay	y 45.19 NF=1536			6,251		5,496		6,251		5,496		6,251		5,496		6,251		5,496		6,251		5,496		6,251		5,496	
21	Avena Fie	eno 62.06 NF=1541			5,487		4,862		5,487		4,862		5,487		4,862		5,487		4,862		5,487		4,862		5,487		4,862	
7	Corn grai	in fine 63%			11,102		9,921		11,415		10,200	1	11,102		9,921		11,102		9,921		11,102		9,921		11,102		9,921	
ΞI	Soybean r	meal 47% NF=16_0479)		6,577		5,824		6,577		5,824		6,577		5,824		6,577		5,824		6,577		5,824		6,577		5,824	i -
ŝ	Wheat bra	an 20-21% Amido/Star	rch		3,368		2,971		3,368		2,971	[3,368		2,971		3,968		3,500		3,368		2,971		3,368		2,971	
	Soybean s	steam flaked			2,046		1,839		2,046		1,839	[2,046		1,839		2,046		1,839		2,046		1,839		2,046		1,839	j.
	Beet pulp	pellet			1,795		1,598		1,795		1,598	1	1,795		1,598		1,795		1,598		2,472		2,200		1,795		1,598	í.
	Sunflowe	er meal 34-35% NF=16_	0481		2,042		1,860		2,042		1,860	[2,042		1,860		2,042		1,860		2,042		1,860		2,042		1,860	j.
	Barley gra	ain gr - PGO=I18261			1,004		0,882		1,004		0,882	1	1,004		0,882		1,004		0,882		1,004		0,882		1,004		0,882	i -
	Neofat				0,454		0,441		0,454		0,441	1	0,454		0,441		0,454		0,441		0,454		0,441		0,670		0,650	j.
	Sugarcan	e molasses 49%			0,171		0,125		0,171		0,125		0,171		0,125		0,171		0,125		0,171		0,125		0,171		0,125	1
	NEOMIN P	1/10 - v2015			0,649		0,634		0,649		0,634		0,649		0,634		0,649		0,634		0,649		0,634		0,649		0,634	1
	Sov Plus				0.495		0.441		0.495		0.441	1	0.495		0.441		0.495		0.441		0.495		0.441		0.495		0.441	١v
	Intake lbs			AF 89	9,664	DM	52,575	AF E	39,976	DM	52,854	AF	91,431	DM	53,144	AF 9	0,264	DM	53,104	AF S	0,341	DM	53,178	AF 1	89,879	DM	52,784	Γ
	Forage					96	49,052			96	48,793			96	49,598			96	48,564			96	48,497			96	48,858	
	NDFI			96BW 1	1,10			96BW	1,10			968W	1,11			968W	1,11			96BW	1,12			%8W	1,10			
	uNDFI			968W (),32			%BW	0,32			%8W	0,32			96BW	0,32			96BW	0,32			%8W	0,32			L
	Cost/head €	C/head			5,9	4			5,9	96			5,9	9			5,9	97			5,9	9			6,0	02		
	Cost/kg DM	¢			0,1	1			0,	11			0.1	1			0.1	11			0,1	1			0,1	11		
						-			-				0/1	-								-						1
	Cost/kg milk	:€ 			0,0	7			0,	07			0,0	7			0,0	07			0,0	7			0,0	07		
	Cost/kg milk IOFC €/hear	e € Id			0,0 10,3	7 26			0, 10,	07 ,24			0,0	7 21			0,0	07 ,23			0,0	07 21			0,0 10,	07 18		
	Cost/kg milk IOFC €/head	€ id Nutrient (25)	U.M.	DM ^c	0,0 10,2	7 26 St	upply	DM	0,0 10,	07 ,24 St	upply	DI	0,0 10, 4 %	07 21 St	ipply	DM	0,0 10,	07 ,23 \$	upply	DM	0,0 10,	07 21 S	upply	DM	0,0 10,	07 18	Supply	_
	Cost/kg milk IOFC €/hear NEI 3x NRC	€ id Nutrient (25)	U.M. Mcal/Ibs	DM ^c	0,0 10,2 % 0,75	97 26 St	upply 39,19	DM	0,1 10, % 0,75	07 ,24 St	upply 39,44	DI	0,0 10, 4 % 0,74	21 St	apply 39,55	DM	0,0 10, % 0,74	07 ,23 S	upply 39,56	DM	0,0 10, % 0,74	07 21 S	upply 39,56	DM	0,0 10, 0,75	07 .18	Supply 39,65	
	Cost/kg milk IOFC €/hear NEI 3x NRC CP	€ d Nutrient (25)	U.M. Mcal/Ibs %	DM 9	0,0 10,2 0,75 16,63	7 26 St	upply 39,19 8,75	DM	0,1 10, % 0,75 16,59	07 ,24 	upply 39,44 8,77	DI	0,0 10, 4 % 0,74 16,53	21 51	1991y 39,55 8,79	DM	0,0 10, % 0,74 16,63	07 ,23 \$	uppiy 39,56 8,83	DM	0,0 10, % 0,74 16,56	97 21 S	upply 39,56 8,81	DM	0,0 10, 0,75 16,57	07 18	Supply 39,65 8,75	^
	Cost/kg milk IOFC €/hear NEI 3x NRC CP SolProt/CP	€ d Nutrient (25)	U.M. Mcs//Ibs %	DM ⁴	0,0 10,2 0,75 16,63 28,48 23,09	5 26 5	upply 39,19 8,75	DM	0,1 10, % 0,75 16,59 28,44 32,97	07 ,24 	upply 39,44 8,77	DI	0,0 10, 4 % 0,74 16,53 28,60 33 19	21 	17 64	DM	0,0 10, % 0,74 16,63 28,56 23,20	07 ,23 \$	upply 39,56 8,83	DM	0,0 10, % 0,74 16,56 28,36 28,36	97 21 \$	upply 39,56 8,81	DM	0,0 10, 6 % 0,75 16,57 28,48 22,95	07 .18	Supply 39,65 8,75	
	Cost/kg milk IOFC C/hear NEI 3x NRC CP SolProt/CP aNDFom Forage aNDFc	: € id Nutrient (25)	U.M. Mcal/Ibs 96 96 96 96	DW	0,0 10,7 0,75 16,63 28,48 33,08 23,22	5 26 5	upply 39,19 8,75 17,39 12,21	DM	0,1 10, % 0,75 16,59 28,44 32,97 23,10	07 ,24 	upply 39,44 8,77 17,43 12,21	DI	0,0 10, 4 % 0,74 16,53 28,60 33,19 23,44	57 21 51	17,64	DM	0,0 10, % 0,74 16,63 28,56 33,20 22,99	07 ,23 S	upply 39,56 8,83 17,63 12,21	DM	0,0 10, % 0,74 16,56 28,36 33,37 22,96	07 21 S	upply 39,56 8,81 17,75 12,21	DM	0,0 10, 4 % 0,75 16,57 28,48 32,95 23,13	07 .18	Supply 39,65 8,75 17,39 12,21	
	Cost/kg milk IOFC €/hear NEI 3x NRC CP SolProt/CP aNDFom Forage aNDFc Sugar (WSC)	: € id Nutrient (25)	U.M. Mcal/Ibs % % %	DM ⁴	0,0 10,7 0,75 16,63 28,48 33,08 23,22 3,99	7 26 St	upply 39,19 8,75 17,39 12,21 2,10	DM	0,0 10, %6 0,75 16,59 28,44 32,97 23,10 3,98	07 ,24 St	upply 39,44 8,77 17,43 12,21 2,10		0,0 10, 4 % 0,74 16,53 28,60 33,19 23,44 3,96	51 51 51	17,64 12,46 2,11	DM	0,0 10, % 0,74 16,63 28,56 33,20 22,99 4,02	07 ,23 S	upply 39,56 8,83 17,63 12,21 2,13	DM	0,0 10, % 0,74 16,56 28,36 33,37 22,96 4,03	97 21 8	upply 39,56 8,81 17,75 12,21 2,14	DM	0,0 10, 4 % 0,75 16,57 28,48 32,95 23,13 3,98	07 18	Supply 39,65 8,75 17,39 12,21 2,10	
	Cost/kg milk IOFC €/hear NEI 3x NRC CP SolProt/CP aNDFom Forage aNDFc Sugar (WSC) Starch	e C d Nutrient (25)	U.M. Mcal/lbs 96 96 96 96 96 96 96	DW	0,0 10,7 0,75 16,63 28,48 33,08 23,22 3,99 26,48	7 26 St	upply 39,19 8,75 17,39 12,21 2,10 13,92	DM	0,0 10, % 0,75 16,59 28,44 32,97 23,10 3,98 26,71	07 ,24 St	upply 39,44 8,77 17,43 12,21 2,10 14,12		0,0 10, 4 % 0,74 16,53 28,60 33,19 23,44 3,96 26,53	17 21 St	17,64 2,11 14,10	DM	0,0 10, % 0,74 16,63 28,56 33,20 22,99 4,02 26,44	07 ,23	uppiy 39,56 8,83 17,63 12,21 2,13 14,04	DM	0,0 10, % 0,74 16,56 28,36 33,37 22,96 4,03 26,27	97 21 \$	upply 39,56 8,81 17,75 12,21 2,14 13,97	DM	0,(10, 0,75 16,57 28,48 32,95 23,13 3,98 26,37	07 .18	Supply 39,65 8,75 17,39 12,21 2,10 13,92	
	Cost/kg milk IOFC €/hear NEI 3x NRC CP SolProt/CP aNDFom Forage aNDFo Sugar (WSC) Starch CHO B3 pdND	c C d Nutrient (25)	U.M. Mcal/lbs 96 96 96 96 96 96 96 96	DM	0,0 10,2 0,75 16,63 28,48 33,08 23,22 3,99 26,48 23,56	7 26 Si	upply 39,19 8,75 17,39 12,21 2,10 13,92 12,38	DM	0,1 10, % 0,75 16,59 28,44 32,97 23,10 3,98 26,71 23,49	07 ,24 Su	239,44 39,44 8,77 17,43 12,21 2,10 14,12 12,41		0,0 10, 4 % 0,74 16,53 28,60 33,19 23,44 3,96 26,53 23,64	17 21 St	39,55 8,79 17,64 12,46 2,11 14,10 12,57	DM	0,0 10, % 0,74 16,63 28,56 33,20 22,99 4,02 26,44 23,62	07 ,23 \$	upply 39,56 8,83 17,63 12,21 2,13 14,04 12,54	DM	0,0 10, % 0,74 16,56 28,36 33,37 22,96 4,03 26,27 23,86	97 21 8	39,56 8,81 17,75 12,21 2,14 13,97 12,69	DM	0,(10, 0,75 16,57 28,48 32,95 23,13 3,98 26,37 23,46	07 .18	Supply 39,65 8,75 17,39 12,21 2,10 13,92 12,38	
	Cost/kg milk IOFC €/hear NEI 3x NRC CP SolProt/CP aNDFom Forage aNDFo Sugar (WSC) Starch CHO B3 pdND CHO C uNDF	c d Nutrient (25) om	U.M. McsV/bs 96 96 96 96 96 96 96 96 96	DM ⁴	0,0 10,7 0,75 16,63 28,48 33,08 23,22 3,99 26,48 23,56 9,53	7 26 St	upply 39,19 8,75 17,39 12,21 2,10 13,92 12,38 5,01	DM	0,/ 10, % 0,75 16,59 28,44 32,97 23,10 3,98 26,71 23,49 9,48	07 ,24 \$1	upply 39,44 8,77 17,43 12,21 2,10 14,12 12,41 5,01		0,0 0,0 10, 4 % 16,53 28,60 33,19 23,44 3,96 26,53 23,64 9,55	51 51 51	39,55 39,55 8,79 17,64 12,46 2,11 14,10 12,57 5,08	DM	0,0 10, 0,74 16,63 28,56 33,20 22,99 4,02 26,44 23,62 9,59	07 ,23 \$	upply 39,56 8,83 17,63 12,21 2,13 14,04 12,54 5,09	DM	0,0 10, % 0,74 16,56 28,36 33,37 22,96 4,03 26,27 23,86 9,52	97 21 \$	upply 39,56 8,81 17,75 12,21 2,14 13,97 12,69 5,06	DM	0,0 10, 0,75 16,57 28,48 32,95 23,13 3,98 26,37 23,46 9,49	07 18 \$	Supply 39,65 8,75 17,39 12,21 2,10 13,92 12,38 5,01	
	Cost/kg milk IOFC C/hear NEI 3x NRC CP SolProt/CP aNDFom Forage aNDFo Sugar (WSC) Starch CHO B3 pdND CHO C uNDF	c d	U.M. Mcst/lbs 96 96 96 96 96 96 96 96 96 96	DM 4	0,0 10,7 0,75 16,63 28,48 33,08 23,22 3,99 26,48 23,56 9,53 24,56	7 26 St	39,19 39,19 8,75 17,39 12,21 2,10 13,92 12,38 5,01 2 3 4	DM	0,1 10, % 0,75 16,59 28,44 32,97 23,10 3,98 26,71 23,49 9,48	07 ,24 St	39,44 39,44 8,77 17,43 12,21 2,10 14,12 14,12 14,12 14,12 12,41 5,01		0,2 0,0 10, 4 % 0,74 16,53 28,60 33,19 23,44 23,44 24,53 23,64 9,55	51 51 51	39,55 8,79 17,64 12,46 2,11 14,10 12,57 5,08	DM	0,0 10, 0,74 16,63 28,56 33,20 22,99 4,02 26,44 23,62 9,59	07 ,23 \$	upply 39,56 8,83 17,63 12,21 2,13 14,04 12,54 5,09	DM	0, c 10, % 0,74 16,56 28,36 28,36 4,03 26,27 23,86 9,52 7,10	97 21 \$	apply 39,56 8,81 17,75 12,21 2,14 13,97 12,69 5,06 2,70	DM	0,1 10, 6% 0,75 16,57 28,48 32,95 23,13 3,98 26,37 23,46 9,49	07 .18	Supply 39,65 8,75 17,39 12,21 2,10 13,92 12,38 5,01	
	Cost/kg milk IOFC C/hear NEI 3x NRC CP SolProt/CP aNDFom Forage aNDFo Sugar (WSC) Starch CHO B3 pdND CHO C uNDF	e d Nutrient (25) om	U.M. McaV/bs % % % % % % % % % % % % % % % % % % %	DM 4	0,0 10,7 0,75 16,63 28,48 33,08 23,22 3,99 26,48 23,56 9,53 8alance	7 26 Si	upply 39,19 8,75 17,39 12,21 2,10 13,92 12,38 5,01 2,77 Milk kg	DM	0,1 10, % 0,75 16,59 28,44 32,97 23,10 3,98 26,71 23,49 9,48 26,71 23,49	07 ,24 St	upply 39,44 8,77 17,43 12,21 2,10 14,12 12,41 12,41 12,41 12,41 12,41 12,41 12,41 12,41 12,41 12,42 12,43 12,44 12,43 12,44 12,43 12,44 12,54 12,54 12,54 12,55 12,5	Supply	0,0 0,0 10, 4 % 0,74 16,53 28,60 33,19 23,44 3,96 26,53 23,64 9,55 8alance	17 21 St	39,55 8,79 17,64 12,46 2,11 14,10 12,57 5,08 2,77 Milk kg	DM	0,0 10, 0,74 16,63 28,56 33,20 22,99 4,02 26,44 23,62 9,59 ~ · · ·	07 ,23 \$ \$	upply 39,56 8,83 17,63 12,21 2,13 14,04 12,54 5,09 2,09 8,09 8,09 8,09 8,09 8,09 8,09 8,00 8,00	DM	0, c 10, % 0,74 16,56 28,36 33,37 22,96 4,03 26,27 23,86 9,52 52 52 52 52 52 52 52 52 52	57 21 S	39,56 8,81 17,75 12,21 2,14 13,97 12,69 5,06 0,00 8,00 0,00 0,00 0,00 0,00 0,00 0	DM	0,1 10, 4 % 0,75 16,57 28,48 32,95 23,13 3,98 26,37 23,46 9,49 	07 18 \$	Supply 39,65 8,75 17,39 12,21 2,10 13,92 12,38 5,01 Milk kg	• • • • • • • • • • • • • • • • • • •
	Cost/kg milk IOFC C/hear NEI 3x NRC CP SolProt/CP aNDFom Forage aNDFc Sugar (WSC) Starch CHO B3 pdND CHO C uNDF 	C d Mutrient (25)	U.M. Hcal/B2 66 66 66 66 66 66 66 66 76 76 76 76 76	DM 4	0,0 10,7 6 0,75 16,63 28,48 33,08 23,22 3,99 26,48 23,56 9,53 8alance 9,28	7 26 5 5 6 8 99,6	uppiy 39,19 8,75 117,39 12,21 2,10 13,92 12,38 5,01 Milk kg 87,62	DM Supply 63,92	0,10, 10, %6 0,75 16,59 28,44 32,97 23,10 3,98 26,71 23,49 9,48 3,55 8alance 0,12	07 ,24 St 96 Req. 100,2	upply 39,44 8,77 17,43 12,21 2,10 14,12 12,41 5,01 0,00 0,00 0,00 0,00 0,00 0,00 0,0	Supply 64,14	0,0 0,0 10, 4 % 0,74 16,53 28,60 33,19 23,44 3,96 26,53 23,64 9,55 8alance 6 0,33	17 21 St 16 Req. 1 100,5	39,55 8,79 17,64 12,46 2,11 14,10 12,57 5,08 7 7 8,88,85	DM Supply 63,99	0,0 10, 0,74 16,63 28,56 33,20 22,99 4,02 26,44 23,62 9,59 ~ · · · Balance 0,15	07 ,23 \$ \$ % Req. 100,2	uppiy 39,56 8,83 12,21 2,13 14,04 12,54 5,09 7,77 Milk kg 88,49	DM Supply 64,12	0, c 10, % 0,74 16,56 28,36 33,37 22,96 4,03 26,27 26,27 8alance 0,31	5 21 5 % Req. 100,5	39,56 8,81 17,75 12,21 2,14 13,97 12,69 5,06 2,77 Milk kg 88,80	DM Supply 64,07	0,1 10, 4 % 0,75 16,57 28,48 32,95 23,13 3,98 26,37 23,46 9,49 	07 18 \$ \$ % Req. 100,5	Supply 39,65 8,75 17,39 12,21 2,10 13,92 12,38 5,01 7 7 8,80 8,80	
	Cost/kg milk IOFC C/hear NEI 3x NRC CP SolProt/CP aNDFom Forage aNDFc Sugar (WSC) Starch CHO B3 pdND CHO C uNDF ME Mcal/day MP g/day	c d Motrient (25)	U.M. Hcal/05 % % % % % % % % % % % % %	DM 4	0,0 10,7 6 0,75 16,63 28,48 33,08 23,22 3,99 26,48 23,56 9,53 8alance 9,53 -0,28 39,6	7 26 5 6 Req. 99,6 101,5	upply 39,19 8,75 17,39 12,21 2,10 13,92 12,38 5,01 Milk kg 87,62 90,16	DM Supply 63,92 2.685,3	0,10, 10, %6 0,75 16,59 28,44 32,97 23,10 3,98 26,71 23,49 9,48 26,71 23,49 9,48 26,71 23,49 9,48 26,71 23,49 2,52,3	07 ,24 \$ \$ 96 Req. 100,2 102,0	apply 39,44 8,77 17,43 12,21 2,10 14,12 12,41 5,01 5,01 5,01 5,01 8,842 88,42 90,80	DI	0,0 0,0 10, 4 % 0,74 16,53 28,60 33,19 23,44 3,96 26,53 23,64 9,55 26,53 23,64 9,55 26,53 23,64 9,55 26,53 23,64 9,55 26,53 23,64 9,55 26,53 25,54 26,53 26,54 26,53 26,54 26,555 26,55 26,55 26,55 26	10 Req. 100,5 102,0	39,55 8,79 17,64 12,46 2,11 14,10 12,57 5,08 2,77 Milk kg 88,85 90,83	DM Supply 63,99 2.698,9	0,(1 0,(1 10, 0,74 16,63 28,56 33,20 22,99 4,02 26,44 26,44 26,44 26,44 26,44 26,45 9,59 *********************************	07 ,23 \$ % Req. 100,2 102,2	upply 39,56 8,83 17,63 12,21 2,13 14,04 12,54 5,09 ~~~ Milk kg 88,49 91,10	DM Supply 64,12 2.701,7	0, (10, % 0,74 16,56 28,36 33,37 22,96 4,03 26,27 26,26 9,52 3,52 3,52 3,52 3,52 3,53 4,03 26,27 27,27 26,27 27,27 27,27 27,27 27,27 27,27 27,27 27,27 20,27 27,27 27,27 28,27 27,27 20,31 4,03 26,27 27,27	5 21 5 5 6 Req. 100,5 102,3	upply 39,56 8,81 17,75 12,21 2,14 13,97 12,69 5,06 ~~~ Milk kg 88,80 91,25	DM Supply 64,07 2.671,2	0,1 10, 0,75 16,57 28,48 32,95 23,13 3,98 26,37 23,46 9,49 9,49 7,57 23,46 9,49 7,73 8elance 0,31 37,8	96 Req. 100,5 101,4	Supply 39,65 8,75 17,39 12,21 2,10 13,92 12,38 5,01 7 7 7 7 8,88 8 8,80 90,07	
	Cost/kg milk IDFC C/hear NEI 3x NRC CP SolProt/CP aNDFom Forage aNDFo Starch CHO B gMND CHO C uNDF · · ·	C d Nutrient (25)	U.M. Hcal/bs 66 66 66 66 66 66 66 66 76 76 76 76 76	DH 4 Supply 63,52 2.669,9	0,0 10,: 0,75 16,63 28,48 33,08 23,22 3,99 26,48 23,56 9,53 Balance 9,63 8,000 8,000 	7 26 5 5 6 Req. 99,6 101,5 158,4	upply 39,19 3,75 17,39 12,21 2,10 13,92 12,38 5,01 3,75 Milk kg 87,62 90,16	DM Supply 63,92 2.685,3	0,10, 10, 96 0,75 16,59 28,44 32,97 23,10 3,98 26,71 23,49 9,48 7,75 8alance 0,12 52,3 111,5	07 ,24 \$k 96 Req. 100,2 102,0 157,8	uppiy 30,44 8,77 17,43 12,21 2,10 14,12 12,41 5,01 5,01 8,8,42 90,80	Supply 64,14 2.692,2	4 % 4 % 0,74 16,53 28,60 23,19 23,44 3,96 26,53 23,64 9,55 8alance 0,33 53,0 111,3	¹⁰ Req. 100,5 102,0 157,1	39,55 8,79 17,64 12,46 2,11 14,10 12,55 5,08 83,85 83,85 90,83	DM Supply 63,99 2.698,9	0, (0, (10, % 0,74 16,63 28,56 33,20 22,99 4,02 26,44 23,62 9,59 ~ Balance 0,15 58,3 113,4	07 ,23 \$ % Req. 100,2 102,2 158,4	upply 39,56 8,83 17,63 12,213 14,04 12,54 5,09 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	DM Supply 64,12 2.701,7	0, (10, % 0,74 16,56 28,36 33,37 22,96 4,03 26,27 23,86 9,52 ~ 8alance 0,31 61,4 110,5	7 21 8 100,5 102,3 158,2	uppiy 39,56 8,81 17,75 12,21 2,14 13,97 12,69 5,06 2,20 88,80 91,25	DM Supply 64,07 2.671,2	0,1 10, 4 % 0,75 16,57 28,48 32,95 23,13 3,98 26,37 23,46 9,49 	9% Req. 100,5 101,4 158,8	Supply 39,65 8,75 17,39 12,21 2,10 13,92 12,38 5,01 7 8,8,80 90,07	
	Cost/kg milk IOFC c/hear NHS13x NRC CP SolProt/CP aNDFom Forage aNDFC Sugar (VSC) Starch CHO B3 pdHD CHO C uNDF 	c d Nutrient (25)	U.M. Hcs//bs % % % % % % % % % % % % % % % % % % %	DH 4 Supply 63,52 2,669,9 12,45	0,0 10,2 6 0,75 16,63 28,48 33,08 23,22 3,99 26,48 23,56 9,53 Balance 9 -0,28 39,6 112,8 0,38 	7 26 5 5 5 6 Req. 99,6 101,5 158,4 103,0 104,5	upply 39,19 8,75 17,39 12,21 13,92 11,38 5,01 0 0 0 0 0 0 0 0 0 0 0 0 0	DM Supply 63,92 2.685,3 12,46	0,10, % 0,75 16,59 28,44 32,97 23,10 3,98 26,71 23,49 9,48 ~~~~ Balance 0,12 52,3 111.5 0,30	07 ,24 % % % % % % % % % % % % % % % % % % %	upply 39,44 8,77 17,43 12,21 2,10 14,12 12,41 5,01 	Supply 64,14 2.692,2 12,68	0,0 0,0 10, 4 % 0,74 16,53 28,60 26,53 23,64 9,55 23,64 9,55 23,64 9,55 53,0 1111,3 5,0,43	6 Req. 100,5 102,0 157,1 103,5	spply 39,55 8,79 17,64 12,46 2,11 14,10 12,57 5,058 9,083 23,80 %DM	DM Supply 63,99 2.698,9 12,55	0, (0, (10, % 0,74 16,63 28,56 33,20 22,99 4,02 26,44 23,62 9,59 8alance 0,15 58,3 113,4 0,34	07 ,23 8 % Req. 100,2 102,2 158,4 102,8	upply 39,56 38,83 17,63 12,21 2,13 14,04 12,25 5,09 2,07 Milk kg 88,49 91,10 22,55 50 00	DM Supply 64,12 2.701,7 12,63	0,0 10, % 0,74 16,56 28,36 33,37 22,96 4,03 26,27 23,86 9,52 3,52 0,31 61,4 110,5 0,40	% Req. 100,5 102,3 158,2 103,2	uppiy 39,56 8,81 17,75 12,21 13,97 12,69 5,06 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	DM Supply 64,07 2.671,2 12,45	0,1 10, 0,75 16,57 28,48 32,95 23,13 3,98 26,37 23,46 9,49 9,49 9,49 9,49 37,8 8alance 0,31 113,0 5,0,31	9% Req. 100,5 101,4 158,8 102,5	39,65 8,75 17,39 12,21 13,92 12,38 5,01 2,38 8,80 90,07 23,59 %DM	
	Cost/kg milk IOFC c/hear NRI 3x NRC CP SolProt/CP aNDFom Forage aNDFC Sugar (WSC) Starch CHO B3 pdND CHO C UNDF 	c d	U.M. Heal/Es 66 66 66 66 66 66 76 76 76 76 76 76 76	DH 4 Supply 63,52 2,669,9 12,45 12,21	0,0 10,: 0,75 16,63 28,48 33,08 23,22 3,99 26,48 23,56 9,53 Balance 9 -0,28 39,66 112,8 0,38 -112,8 0,38 -112,8 0,38 -112,8	7 26 5 5 6 Req. 99,6 101,5 158,4 103,0 88,4	upply 39,19 8,75 17,39 12,21 2,10 13,92 12,38 5,01 67,62 90,16 23,68 %DM 22,26 %DM	DM Supply 63,92 2.685,3 12,46 12,21	0, 10, % 0,75 16,59 28,44 32,97 23,10 3,98 26,71 23,49 9,48 7 * * * 0,12 52,3 111,5 0,30 -1,60	07 ,24 \$ \$ 96 Req. 100,2 102,0 157,6 102,5 88,4 20,0	upply 39,44 8,77 17,43 12,21 14,12 12,41 5,01	Supply 64,14 12,692,2 12,6	0,0 0,0 10, 10, 16,53 28,60 33,19 23,44 9,55 26,53 23,64 9,55 24,64 24,555 24,5557 24,5557 24,5557 24,5577 24,55777 24,5577777777777777777777777777777777777	6 Req. 100,5 102,0 157,1 103,5 90,2 20,2	23.80 %DM 23.80 %DM 24.00 %DM 24.00 %DM 25.80 %DM 23.80 %DM 23.80 %DM 23.80 %DM 23.80 %DM	DM Supply 63,99 2.698,9 12,56 12,21	0,(10, % 0,74 16,63 28,56 33,20 22,99 4,02 26,44 26,44 9,59 ~ · · · 8elance 0,15 58,3 113,4 0,34 -1,00	07 ,23 \$ % Req. 100,2 102,2 158,4 102,8 88,4 \$	upply 30,56 8,83 17,63 12,21 2,13 14,04 12,54 5,09 9,7 Milk 69 88,49 91,10 23,55 %DM 22,95 %DM	DM Supply 64,12 2.701,7 12,63 12,21	0, (10, % 0,74 16,56 28,36 4,03 26,27 23,86 9,52 33,37 22,96 4,03 26,27 3,37 23,86 9,52 3,37 10,56	No Req. 100,5 102,3 158,2 103,2 88,4	upply 39,56 8,81 17,75 12,21 2,14 13,97 12,69 5,06 ~~~~ Milk kg 88,80 94,25 23,74 %DM 22,95 %DM	Supply 64,07 2.671,2 12,45	0,1 10, 6 % 0,75 16,57 28,48 32,95 23,13 3,98 26,37 23,46 9,49 9,49 9,49 0,31 37,8 113,0 5,031 37,8 113,0 5,031	96 Req. 100,5 101,4 158,8 102,5 88,4	39,65 8,75 17,39 12,21 13,92 12,28 5,01 7 7 88,80 90,07 23,59 %DM 23,13 %DM	
	Cost/kg milk IDFC C/hear NEI 3x NRC CP aNDFom Forage aNDFC Starch CHO B3 pdHD CHO C uNDF CHO C uNDF CHO C uNDF HP g/day NH3-H g peNDF lkg Forage aNDFC	c d	U.M. Heal/Ba 56 56 56 56 56 56 56 56 56 56 56 56 56	DH 4 Supply 63,52 2,669,9 12,45 12,21 57,1	0,0 10,: 0,75 16,63 28,48 23,22 3,99 26,48 23,58 9,53 9,55 9,	7 26 5 5 99,6 101,5 158,4 103,0 88,4 88,8	upply 39) 8,75 17,39 12,21 2,10 13,92 12,38 5,01 3,50 4,16 87,62 90,16 23,58 %DM 23,25 %DM 23,22 %DM 2,14 %MP	DM Supply 63,92 2.685,3 12,46 12,21 57,4	0, 10, % 0,75 16,59 28,44 32,97 23,10 3,98 26,71 23,49 9,48 26,71 23,49 9,48 26,71 23,49 9,48 26,71 23,49 9,48 26,71 11,5 0,30 11,5 52,3 111,5 0,30 2,6,5 52,5 1,5,5 2,5 1,5,5 2,5 1,5,5 2,5 1,5,5 2,5 1,5,5 2,5 1,5,5 2,5 2,5 2,5 2,5 2,5 2,5 2,5 2,5 2,5	07 ,24 \$4 96 Req. 100,2 102,0 157,8 102,5 88,4 89,2 2,7,5	uppiy 39,44 8,77 17,43 12,21 2,10 14,12 12,41 5,01	Supply 64,14 2.692,2 12,69 12,44	0,74 0,74 16,53 28,60 33,19 23,44 9,55 23,64 9,55 24,64 11,35 11,35 14,55 14,55 14,55 14,56 14,565 14,5	6 Req. 100,5 102,0 157,1 103,5 90,2 89,3 89,3 89,3 89,3 102,0 157,1 103,5 102,0 157,1 103,5	spply 39,55 39,57 8,79 17,64 2,11 12,46 2,11 14,10 2,50 38,85 90,83 23,80 %DM 23,80 %DM 2,44 %DM 2,44 %DM	DM Supply 63,99 2,698,9 12,56 12,21 57,5	0,0 0,0 10, 10, 10, 10, 10, 10, 10, 10,	07 ,23 S % Req. 100,2 102,2 158,4 102,8 88,4 89,4 02,5	upply 39,56 8,83 17,63 12,21 2,13 14,04 5,09 5,09 5,09 91,10 22,55 %DM 22,55 %DM 22,55 %DM 22,55 %DM	DM Supply 64,12 2.701,7 12,63 12,21 57,7	0, (10, % 0,74 16,56 28,36 33,37 22,96 9,52 23,86 9,52 33,37 8atance 4 0,31 61,4 110,5 0,40 -1,8	17 21 5 5 100,5 100,5 102,3 156,2 103,2 88,4 89,6 89,6	upply 30,56 8,81 17,75 12,21 2,14 13,97 12,69 5,06 2,14 88,80 91,25 23,74 %DM 22,36 %DM 22,16 %DM	DM Supply 64,07 2.671,2 12,45 12,21 57,1	0,1 10, 6 % 0,75 16,57 28,48 32,95 23,13 3,98 26,37 23,46 9,49 23,46 9,49 23,46 9,49 23,46 9,49 23,46 9,49 23,46 9,49 23,46 9,49 23,46 9,49 23,46 9,49 23,46 9,49 23,46 23,13 3,78 14,78 14,77 14,78 14,77 14,78 14,78 14,78 14,78 14,78 14,78 14,78 14,78 14,78 14,78 14,78 14,77 14,78 14,78 14,78 14,78 14,77 14,78 14,78 14,7788 14,7788 14,7788 14,7788 1	07 18 5 5 5 6 7 6 8 7 6 8 8 7 100,5 101,4 158,8 102,5 88,4 88,7 2020	30,65 8,75 17,39 12,21 2,10 13,92 12,28 5,01 8,8,60 90,07 23,59 %DM 23,13 %DM 2,14 %MP	
	Cost/kg milk IDFC C/hear NEI 3x NRC CP Solirot/CP aNDFom Forage aNDFC Sugar (WSC) CHO 83 gdNC CHO 83 gdNC CHO 83 gdNC CHO 83 gdNC CHO 83 gdNC HD gday NI3-N g peNDF lbs Forage aNDFC het g Lys g	c d	U.M. Hcal/Es 56 56 56 56 56 56 56 56 76 76 76 76 76 76 76 76 76 76 76 76 76	DM 4 Supply 63,52 2.669,9 12,45 12,21 57,1 177,5	0,0 10,7 0,75 16,63 28,48 33,08 23,22 3,90 26,48 23,56 9,53 Balance 9 -0,28 39,6 112,8 0,36 112,8 0,36 -1,60 -7,2 -5,7 -5,	7 26 5 5 99,6 101,5 158,4 103,0 88,4 88,8 90,9 2	30,19 30,19 8,75 12,21 2,10 13,92 12,38 5,01 7,52 8,7,62 23,68 %DM 23,25 %DM 23,25 %MP	DM Supply 63,92 2.685,3 12,46 12,21 57,4 178,5	0, 10, % 0,75 16,59 28,44 32,97 23,10 3,98 26,71 23,49 9,48 ~~~~ 8atance 0,12 52,3 111,5 0,12 52,3 111,5 0,6,9 -1,60 -0,9 -0,9 -0,9 -0,9 -0,9 -0,9 -0,9 -0,	07 ,24 \$4 \$6 Req. 100,2 102,0 157,8 102,5 88,4 89,2 97,3 102,5	upply 39,44 8,77 17,43 12,21 14,12 12,21 14,12 12,21 14,12 90,80 23,57 %DM 23,10 %DM 2,14 %MP 5,55 %MP	Supply 64,14 2.692,2 12,65 12,44 57,1 173,0	0,0 0,0 0,0 0,0 0,0 0,0 0,0 10, 10, 10,	100,5 100,5	23,55 8,79 17,64 12,46 2,11 14,10 12,57 5,08 88,85 88,85 23,80 %DM 23,44 %DM 23,44 %DM 23,44 %DM 23,44 %DM	DM Supply 63,99 2,698,9 12,56 12,21 57,6 179,2	0,(1 0,74 16,63 28,56 33,20 22,99 4,02 26,44 23,62 9,59 2,54 2,54 2,54 2,54 2,55 3,10 1,15 58,3 113,4 0,15 58,3 113,4 0,45 58,3 113,4 0,45 1,34 0,45 1,45 1,45 1,45 1,45 1,45 1,45 1,45 1	07 23 \$ \$ 9% Req. 100,2 102,2 158,4 102,8 88,4 89,4 97,5	upply 33,56 8,83 12,63 12,21 2,13 14,04 12,54 5,09 88,49 88,49 88,49 23,55 %DM 22,95 %DM 22,95 %DM 5,64 %MP 5,64 %MP	DM Supply 64,12 2.701,7 12,63 12,21 57,7 179,8	0, (10, % 0,74 16,56 28,36 33,37 22,96 4,03 26,27 23,86 9,52 23,86 9,52 23,86 9,52 3,57 6,14 10,5 0,31 61,4 10,5 0,4 0,4 10,5	5 5 5 100,5 102,3 156,2 103,2 88,4 89,6 97,8 97,8	39,56 8,81 12,75 12,21 2,14 13,97 12,69 5,06 7 7 Milk kg 88,80 88,80 91,25 23,74 %DM 22,96 %DM 22,36 %DM 5,55 %MP	Supply 64,07 2.671,2 12,45 12,21 57,1 177,6	0,6 10, 0,75 0,75 28,48 32,95 23,13 3,98 26,37 23,46 9,49 Balance 0,31 113,0 0,31 -1,80 ,3 ,59 	07 18 96 Req. 100,5 101,4 158,8 102,5 88,4 88,7 96,8	Supply 39,65 8,75 17,39 12,21 2,10 13,92 12,38 3,01 2,39 Milk kg 83,60 90,07 23,59 %DM 23,13 %DM 23,13 %DM	
	Cost/kg milk IDFC C/hear NEI 3x NRC CP SollPtot/CP aNDFom Forage aNDFC Starch CHO B3 pdND CHO B3 pdND CHO C uNDF ··· ME Hcal/day MP g/day NH3-N g peNDF lbs Forage aNDFC Het g Lys g Total EAA g/	c d	U.M. McaV/05 59 59 59 50 50 50 50 50 50 50 50 50 50	DM 9 Supply 63,52 2,669,9 12,45 12,21 37,1 177,5 1,256,9	0,0 10,7 0,75 16,63 28,48 33,08 23,22 3,99 26,48 23,56 9,53 8alance 9,53 9,53 	7 26 50 99,6 155,4 103,0 88,4 88,8 99,9 102,7	upply 30.19 8,75 17,39 12,21 2,10 13,92 12,38 5,01 ~~~~ Milk log 87,62 90,16 23,68 %DM 23,28 %DM 23,28 %DM 23,68 %MP 47,45 %MP	DM Supply 63,92 2.685,3 12,46 12,21 57,4 178,5 1,274,2	0, 10, % 0,75 16,59 28,44 32,97 23,10 3,98 26,71 23,49 9,48 7,77 8atance 0,12 52,3 111,5 0,30 -1,80 -8,9 -5,0 38,7	07 ,24 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	apply 39,44 8,77 17,43 12,21 2,10 14,12 12,41 5,501 	54,14 54,14 2.692,2 12,63 12,44 12,74,1 1,277,3	0,0 0,0 10, 10, 4 % 0,74 16,53 28,60 33,19 23,44 3,96 26,53 23,64 9,55 23,64 24,55 24,566 24,5666 24,5666 24,56666 24,5666666666666666666666666666666666666	100,5 100,5 100,5 100,5 102,0 157,1 103,5 190,2 193,3 103,5 10,5 10,5 10,5 10,5 10,5 10,5 10,5 10	239.55 8,79 17,64 12,46 2,11 14,10 12,57 5,08 ~~~~ Milk kg 88,85 90,83 23,80 %DM 23,80 %DM 23,44 %DM 23,44 %DM 23,44 %DM 47,45 %MP	DM Supply 63,99 2,698,9 12,56 12,21 57,6 179,2 1,279,8	0,(0,(10, 0,74 16,63 28,56 33,20 22,99 4,02 26,44 23,62 9,59 4,02 26,44 23,62 9,59 4,02 864ance 0,15 58,3 113,4 0,34 -1,69 -4,7 42,1	07 23 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	upply 39,56 8,83 17,63 12,21 2,13 14,04 12,24 5,09 3 3 4,04 88,49 91,10 22,85 %DM 22,95 %DM 22,95 %DM 22,95 %DM 22,95 %DM 22,95 %DM 24,742 %MP	DM Supply 64,12 2.701,7 12,63 12,21 57,7 179,8 1.281,9	0, C 10, % 0,74 16,56 28,36 33,37 22,96 4,03 26,27 23,86 9,52 7,57 8,18 61,4 110,5 0,40 -1,80 -8,07 4,11 44,3	7 21 5 5 6 Req. 100,5 150,2 103,2 103,2 88,4 89,6 97,8 103,6	wpply 39,56 8,81 17,75 12,21 2,14 13,97 12,69 5,06 88,80 91,25 23,74 %DM 22,36 %DM 22,36 %DM 22,14 %MP 6,55 %MP 47,45 %MP	Supply 64,07 2.671,2 12,45 12,21 177,6 1.267,4	0,4 10, 0,75 16,57 28,48 32,95 23,13 3,98 26,37 23,46 9,49 Balance 0,31 37,8 113,0 0,31 -1,60 1,37 4,59 5,59 4,32,7 3,2,7 3,2,7 	07 18 5 9% Req. 100,5 101,4 158,6 102,5 88,4 88,7 96,8 102,6	Supply 39,65 8,75 17,39 12,21 2,10 13,92 12,28 5,01 7 7 7 8,8,80 90,07 23,59 %DM 23,13 %DM 23,13 %DM 23,13 %DM 2,14 %MP	

Given the ability of the **Multitasking Recipes Manager** to allows modification and evaluation of multiple versions of a recipe on the same screen to new tabs, it is very useful, for example, for revising diets, developing comparative proposals

for alternate ration strategies, or formulating bids for multiple manufacturers with different products (for instance one with Protein Blend A vs another with Protein Blend B vs another with Protein Blend C).

Feeds (14)		Ve	ersion 1				
Corn silage 32.4432 NF=15_027	7		19,477	1	6,266		
Alfalfa hay 45.19 NF=1536		2,453	1	2,157	←──	Feeds included	
Avena Fieno 62.06 NF=1541			2,203		1,952		in the recipe
Corn grain fine 63%			4,694		4,194		
Soybean meal 47% NF=16_0479			1,983		1,756		
Wheat bran 20-21% Amido/Star	ch		1,169		1,031		
Soybean steam flaked			0,914		0,822		
Beet pulp pellet			0,680		0,605		
Sunflower meal 34-35% NF=16_	0481		0,677		0,616		
Neofat			0,163		0,159		
Sugarcane molasses 49%			0,701		0,514		
NEOMIN P1/10 - v2015			0,315		0,308		
Soy Plus			0,800		0,713		
Potassium Carbonate			0.104		0.103		
Intake kg		AF	36,333	DM	21,195		Intake
Forage				96	48,950		
NDFI		968W	0,96				
uNDFI		968W	0,27				
Cost/head €/head			5,	48		•	Costs and
Cost/kg DM €			0,	26			Efficiency
Cost/kg milk €			0,	14			
IOFC C/head			10	,32			
Milk officiency ke			12	,05			
ECM efficiency kg			1,	840			
contentionery kg			1,	0/4			
Nutrient (25)	U.M.	D	4196		Supply		
NEI 3x NRC	Mcal/kg		1,64	·	34,83		
СР	96		16,12	! <u> </u>	3.417,49		Nutrient
SolProt/CP	96		28,16	·			analysis
aNDFom	96		32,46	·	6.879,12		
Forage aNDFom	96		23,17	<u> </u>	4.909,72		
Sugar (WSC)	96		5,42	·	1.148,78		
Starch	96		25,89		5.486,84		
CHO B3 pande	19		23,24		4.925,63		
	NCPS	Supply	Balance	% Req.	Milk kg		
ME Mcal/day		63,82	2 -1,13	98,3	37,99	◄	Model
MP g/day		2.560,7	-160,2	94,1	35,34		parameters
NH3-N g			85,1	149,2			
peNDF kg		4,9	6 0,08	101,7	23,38 %DM		
Forage aNDFom kg		4,9	1 0,14	102,9	23,17 %DM		
Met g		54,	4 -10,9	83,3	2,12 %MP		
Lys g		171,	4 -17,0	91,0	6,69 %MP		

The main Multitasking screen is organized in five sections, each with its specific data:

- Feeds included in the recipe
- Intake
- Costs and Efficiency
- Nutrient analysis
- Model parameters
 - NCPS summary
 - > Fermentability
 - Rumen Ph
 - Rumen fill
 - ➢ Well-being risks

In order to facilitate the management of the Multitasking screen, data are also organized by columns; if we consider the first section, the first column contains the list of the ingredients of the recipe, beside it there are two columns with the AF and DM amounts of the ingredients. These two columns are grouped and labelled Version 1, and their data match those of the initial recipe until some changes are made. It is possible to add further versions, labelled Version 2, Version 3, etc., by right clicking on the header of any existing version. When more than one version is displayed, data are shown with an alternate color of the background, to enhance their relation to a specific version:

Feeds (15)	Ve	rsion 1	Ve	rsion 2	Ve	rsion 3		
Corn silage 32.4432 NF=15_0277	21,758	7,000	23,314	7,500	20,205	6,50		
Alfalfa hay 45.19 NF=1536	2,835	2,493	2,835	2,493	2,835	2,49		
Avena Fieno 62.06 NF=1541	2,489	2,205	2,489	2,205	2,489	2,20		
Corn grain fine 63%	5,036	4,500	5,036	4,500	5,595	5,00		
Soybean meal 47% NF=16_0479	2,983	2,642	2,983	2,642	2,983	2,64		
Wheat bran 20-21% Amido/Starch	1,528	1,348	1,528	1,348	1,528	1,34		
Soybean steam flaked	0,928	0,834	0,928	0,834	0,928	0,83		
Beet pulp pellet	0,814	0,725	0,814	0,725	0,814	0,72		
Sunflower meal 34-35% NF=16_0481	0,926	0,844	0,926	0,844	0,926	0,84		
Barley grain gr - PGO=I18261	0,456	0,400	0,456	0,400	0,456	0,40		
Neofat	0,206	0,200	0,206	0,200	0,206	0,20		
Sugarcane molasses 49%	0,078	0,057	0,078	0,057	0,078	0,05		
NEOMIN P1/10 - v2015	0,294	0,288	0,294	0,288	0,294	0,28		
Sov Plus	0.224	0.200	0.224	0.200	0.224	0.200		
Intake kg	AF 40,671	DM 23,848	AF 42,226	DM 24,348	AF 39,677	DM 23,848		

While the topmost two sections are designed to accept inputs to modify feed amounts, on as fed or dry matter basis, or the total intake of the recipe, the other three are for output only.

The model section can be customized in order to contain different sets of data, selectable with a context menu:



These sets of data are organized and displayed as in the main recipe screen.

Multitasking comes with many features able to support an efficient formulation work:

Creating and modifying versions: the first version (Version 1) contains data of the initial recipe. The most useful feature of Multitasking is the capability to manage more versions at the same time (side by side). This allows comparative formulation of different recipes that share a common set of ingredients, but can have different amounts for their ingredients in each version. The change of a certain amount and the consequential changes to the recipe evaluation can be observed in the output sections, giving a clear picture of its impact on analytical values, costs and model parameters. **Managing composites:** If the initial recipe has composites in its ingredients list, these can be are displayed. The overall amount of the mix is still visible, along with the AF and DM amounts of its ingredients. Every time the amounts of the ingredients of the composite are edited, this is re-formulated, with changes to its overall amount, percent composition, analysis and cost. When the overall amount of the composite is changed, the amounts of its ingredients are also changed, according to their current percent inclusion. Changing the amounts of ingredients in a certain version, affects the composite and recipe values in that version only; so making different changes in different versions, is like having different composites for each version.

Ingredients list commands: there are some basic operation to manage the ingredient list and these commands work much like the corresponding commands in the recipe screen.

Feed costs management: If the costs of some ingredients need to be changed, it is possible to change the visualization of the screen in order to allow the change of the individual cost or cost origin of each ingredient. Since the amounts of the ingredients can change among different versions, we have a column for each version to show the related differences in terms of costs. Any change to a cost of an ingredient determines the update of the total costs of each version of the recipe. **Animal Inputs:** a detailed view of the Animal input parameters is available. The grids are like those in the Animal Inputs tab of the recipe screen; each version can have its own set of parameters, since it is possible to edit the parameters of each version independently.

Multiple saving: the feature allows to save a selection of the versions as new recipes. Some descriptive data of the versions are changeable: name, description, ID Codes and notes. Initially, these descriptions match those of the recipe of origin but it is worth to change this information before saving, If the initial recipe is assigned to a pen of a farm, the resulting new recipes will also be assigned to that pen. The program will assign a new ID code automatically.

Comparing different versions with the comparisons tool of the recipe: it is possible to send a selected set of versions to the comparisons tool of the recipe screen. Each selected version becomes a different snapshot, which can be compared with the other stored snapshots (including the one obtained from the original recipe).

Settings: it is possible to set some setting about which data are displayed; these settings are saved when closing the Multitasking panel and kept the next time the feature is used again. The settings are related to costs or efficiency, nutrient and model parameters.

Reports: you can print three types of report: *Overall report* with all the recipes formulated on the Multitasking, *Recipe report* with one version of the version in a single, and *Multiple report* with recipes selected among the different versions.

Send us your comments on these topics! What do you think about the best and easiest ways for consultants to handle nutritional economics? Dave is at <u>rumendvm@gmail.com</u>; Buzz is at <u>bburhans@dairynutritionhealth.com</u>

Check the NDS-NA Facebook page for the latest information on NDS features

https://www.facebook.com/rumenNDSpro/

Note that the features and utilities developed by the NDS team described above are not components of the underlying CNCPS model, and do not change the CNCPS outputs or results. <u>Questions about use of these features should be directed to the NDS support team, and not to the CNCPS group at Cornell</u>





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