

## FAS / FST Parameters & calculations

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## 1. Document log

Date	Version	Init.	Changed
16-12-2005	1.44	RUT	Min., max., mixture calculations, etc. added,
16-12-2005	1.45	HDR	Chapter 2 erased. Explanation inserted in chapter 6 & 7
09-01-2006	1.46	RUT	Formula 6: Fill value lactation, denominator adjusted,
17-01-2006	1.47	HDR/EL	After meetings with the LABs. Changes Marked with yellow.
19-01-2006	1.48	HDR	After FAS group meeting.
20-01-2006	1.49	HDR	Input from Systematic
27-01-2006	1.50	RUT	After meeting between Lars, Erica and Rudolf
31-01-2006	1.51	HDR	
03-02-2006	1.52	RUT/EL	
03-02-2006	1.53	HDR	
17-02-2006	1.54	RUT	Most changes marked with yellow
	1.55	RUT	Abbreviations in Other parameters corrected
03-04-2006	1.56	RUT	Formula for kdNDF and Ureacorection added translations of storage types and variety groups.
04-04-2006	1.57	RUT	Swedish names for storage types, Price_KgDM added + formula for calculation, marked with yellow
10-04-2006	1.58	RUT	Norwegian names for storage types added marked with yellow
10-05-2006	1.59	RUT	Parameters sCP + pdCP and Typed kdNDF added, changes marked with yellow
15-08-2006	1.60	RUT	Calculations of share in mixtures changed, passage rates in mixtures calculations corrected, equation for calculation of NE (DK) added, parameters Domestic_pct and AAN_Typed added, name sCP+pdCP changed to s_pdCP , equations 32, 33, 35 and 39 deleted, equation 34 changed, FAS basic data added. Changes marked with yellow.
15-09-2006	1.63	RUT	Equation 31 adjusted, EFOS correction
06-10-2006	1.64	RUT	CP changed to CPcorr in mixture calculations equation 50, 52, 53 & 54. Mixture calculations for SumpdCP, b and amino acids (Ala, Arg, Asp, etc.) moved from equation 55 to 54. Changes marked with yellow.
18-10-2006	1.65	RUT	Last part of equation 54 separated into a new equation (66) and denominator corrected from $XX_a$ to $CPcorr_a$ . Changes marked with yellow.
21-11-2006	1.66	RUT	Mixture calculations in equation 50, 52, 53, 54 and 55 changed back from CPcorr to CP. Equation 66 deleted. Equation 40 for calculation of Iodine value included. Parameter for Conversion feed included. Part 6, 7 and 8.11 deleted (Part 6 and 7 are included in IFS002 Laboratory Interface to NorFor). Changes marked with yellow.
12-12-2006	1.67	RUT	Adjustment of equation 31. Changes marked with yellow.
22-01-2007	1.68	RUT	First If-sentence and kp-values for forage in equation 50 deleted. Equation 63 adjusted to kgDM. Changes marked with yellow.

28-02-2007	1.69	RUT	Equation 66. New mixture calculation for AAN, AAN_Typed and individual amino acids added.
13-03-2007	1.70	RUT	Equation 31 adjusted.
14-03-2007	1.71	RUT	Parameters AAT (SE) and PBV (SE) added.
13-08-2007	1.72	JB/RUT	Analysis and Reference methods Table 8.4 & 8.5 adjusted. Equations 41, 42 & 43: OE (SE), AAT (SE) & PBV (SE). Changes for Mixture cost in equations 63 & 64. Equation 31 calculation from EFOS changed.
14-08-2007	1.73	JB	Changes in equations 42 & 43: AAT (SE) & PBV (SE). Validation min & max added.
05-11-2007	1.74	JB	Equations 41, 42 & 43 deleted. Parameters OwnCrop_pct, ME_Horse & Dig_CP added.
29-02-2008	1.75	MÅ	New parameter is added conversion feed grown 1 <sup>st</sup> year (Conversion_yr1_pct) and thus the mixture calculation of the same parameter.
28-04-2008	1.76	MÅ	Changed calculation for kdNDF eq 36.
21-11-2008	1.77	JB/RUT	Units changed to log cfu/g on Cl_spo, Moulds and Yeast. New microbiological parameters added Bacillus spores, Entero bacteria, Infected kernels and Moulds, storage.
07-01-2008	1.78	MÅ	New parameters are Molybden, Actual Price and TypkdRestCHO . New calculation for kdRestCHO (41)
15-05-2009	1.79	RUT	Activation of kdRestCHO calculation with changes in RestCHO and sugar. Prices per MJ (Eq 9 and 25) are zero for feedstuffs with no energy.
06-01-2010	1.80	MÅ	No changes
02-07-2010	1.81	MÅ	NE (eq.39) is changed and equal to NEL20 divided by the value of Barley (001-0008) of 7.43 MJ NEL <sub>20</sub> /kg DM.
16-01-2011	1.82	MÅ	NE_original (eq 26) and its mixture (NE_original_a) are added to manage CP_NE in FRC. Analysis reports need DM_NE (eq 38).ME (eq 27), AAT_SE (eq 28) and PBV_SE (eq 29).
29-09-2011	1.83	MÅ	New parameter for Lab analysis report kg_NE in eq 42.
20-04-2012	1.84	MÅ	Changed eq number and names Eq 26 IV had previously nr 40 Eq 32 pdCP had previously nr 34 Eq 33 kdNDF had previously nr 36 Eq 34 AAN had previously nr 37 Eq 35 NE_original had previously nr 26 Eq 36 DM_NE_original had previously nr 38 and the name DM_NE Eq 37 kg_NE_organic had previously nr 42 and the name kg_NE Eq 38 NE had previously nr 39 30 dCP_DK is new 39 DM_NE is new 40 kg_NE is new
23-11-2012	1.85	MÅ	New equation. Gross energy equation 42 GE
21-10-2013	1.86	MÅ	Change the unit of NO <sub>3</sub> to g per kg DM. Corrections of mixture calculations of FE <sub>N</sub> . New standard feed values of His <sub>20</sub> , Lys <sub>20</sub> and Met 20 (eq 43,44 and 45 resp) and their mixture calculations (eq 68).

30-01-2014	1.86	MÅ	Correction of equation 66 in the document. (The calculation in production is correct)
15-12-2014	1.90	MÅ	Correction of equation FVL. New equation 49 for iNDF. New parameter TypiNDF editable. Equation 33 kdNDF is changed. New parameter NDFD20 (eq 70).
29-06-2018	1.99	MÅ	Correction of NE_original (eq 35), correction of NDFD20 (manage minerals) (eq 70). New equations for OMD8, OMD20, td_OM8, td_OM20 (eq 71,72,73, 74) and their mixtures (eq 69 and 51)
17-10-2018	2.00	MÅ	New input of climate impact of feed CO2e. Mixture of CO2e_a (eq 51)
09-05-2019	2.01	MÅ	A new input of climate impact carbon in soil/carbon sequestration (C_soil). Put in the table for Other analyses. Six new parameters according to Finnish feed table D_value, iNDF_DM, Biotin, ME_FI, AAT_FI and PBV_FI. Equation 31 for OMD is changed for handling D-value. Equation 49 for iNDF is changed for handling iNDF_DM.
31-05-2019	2.02	MÅ	A new input of needed area per kg DM produced feed, Area. Also a feed mixture should be able to calculate Area_a (eq 51). Unit for the parameter Total germs (ToGe) is changed from number to log cfu per gram.
10-01-2019	2.03	MÅ	Eq 31 OMD invivo calculation from EFOS analysed on fresh maize whole crop is changed. Input "Area needed" changed name to "Land requirement".
16-10-2020		MÅ	Document is updated with variety groups, varieties contractors in chapter 8.5, 8.7, 8.8 and 8.9

### 3. Overview of Feed Stuff Parameters and calculations

**Parameter name:** Language specific

**Abbreviation:** Unique identification of parameters for use in formulas

**AFI:** Analyzed Feedstuff Input

**Unit:** Language specific

**Std.value:** If the parameter is NULL the std. value is used in the FRC calculations.

**Validation:** min >= Parameter value entered <= max

**Decimal:** Values are shown with the number of decimals

**Calculations:** Calculations & recalculations can be found in section 4. Recalculations are shown in calculation order. Mixture calculations can be found in section 5.

#### 1. General

Parameter name	Abbreviation	Unit	FRC Std. value	Validation		Dec.	Calculations		
				Min	Max		Value	Recalculation	Mix.
Dry matter uncorrected	DMuncorr	g / kg		1	1000	0			65
Dry matter	DM	g / kg	0	0	1000	0		10;9;13	65
Dry matter percentage	DM_pct	% of kg		0	100	1	10		60
Organic DM	Organic_pct	% af DM	0	0	100	1			51
Organic forage	OrgFor	% of DM	0	0	100	1			51
Domestic_pct	Domestic_pct	% of DM	0	0	100	1			51
Conversion feed pct	Conversion_pct	% of DM		0	100	1			51
Conversion feed from 1 <sup>st</sup> year pct	Conversion_year_pct	% of DM		0	100	1			51
Own Crop	OwnCrop_pct	% of DM		0	100	1			51
Ash	Ash	g/kg DM	0	0	1000	0		33,4;41;8;12;16;17;18;19;20;21;9;13;35	51
Organic matter	OM	g/kg DM		0	1000	0	8		51
IVOS	IVOS	% of OM	0	0	100	1		31	58
EFOS	EFOS	% of OM	0	0	100	1		31	58
VOS	VOS	% of OM	0	0	100	1		31	58
D-value	D_value	g/kg DM	0	0	1000	0		31	51
OMD invitro	OMDinvit	% of OM	0	0	100	1		31	58
Organic matter digestibility	OMD	% of OM	0	0	100	1	31	33,6;35	58

#### 2. Protein

Parameter name	Abbreviation	Unit	FRC Std. value	Validation		Dec.	Calculations		
				Min	Max		Value	Recalculation	Mix
Crude protein	CP	g / kg DM	0,000001	0	1000	0		4;41;11;12;16;17;18;19;20;21;9;13;35	51
Crude protein corr	CPcorr	g / kg DM	0,000001	0	1000	0	11		51
Soluble crude protein	sCP	g / kg CP	0	0	1000	0		16;17;18;19;20;21;9;13	52
Ammonia N	NH <sub>3</sub> N	g N/ kg N	0	0	1000	0		6;11;12;16;17;18;19;20;21;9;13	55
Amino acid N	sAAN	g N/ kg N	0	0	1000	0			55
Peptide N	sPeN	g N/ kg N	0	0	1000	0			55
Protein N	sPN	g N/ kg N	0	0	1000	0			55
Potentially degradable crude protein	pdCP	g / kg CP	0	0	1000	0	32		53
Sum of sCP and pdCP	SumspdCP	g / kg CP	0	0	1000	0		32;16;17;18;19;20;21;9;13	53
Indigestible crude protein	iCP	g / kg CP	0	0	1000	0		16;17;18;19;20;21;9;13	54
Degradation rate, soluble crude protein	kdsCP	% / hour	0,000001	0	999	0		16;17;18;19;20;21;9;13	61
Degradation rate, potentially degradable crude protein	kdCP	% / hour	0,000001	0	99	1		16;17;18;19;20;21;9;13	50

### 3. Amino acids

Parameter name	Abbreviation	Unit	FRC Std. value	Validation		Dec.	Calculations			
				Min	Max		Value	Recalculation	Mix	
Amino acids typed	AAN_Typed	g N / 100 g N	0	0	100	1			34	66
Amino acids	AAN	g N / 100 g N	0	0	100	1	34	16;17;18;19;20;21;9;13		66
Alanine	Ala	g / 100 g CP	0	0	100	2				66
Arginine	Arg	g / 100 g CP	0	0	100	2				66
Aspartic acid	Asp	g / 100 g CP	0	0	100	2				66
Cysteine	Cys	g / 100 g CP	0	0	100	2				66
Glutamic acid	Glu	g / 100 g CP	0	0	100	2				66
Glycine	Gly	g / 100 g CP	0	0	100	2				66
Histidine	His	g / 100 g CP	0	0	100	2				66
Isoleucine	Ile	g / 100 g CP	0	0	100	2				66
Leucine	Leu	g / 100 g CP	0	0	100	2				66
Lysine	Lys	g / 100 g CP	0	0	100	2				66
Methionine	Met	g / 100 g CP	0	0	100	2				66
Phenylalanine	Phe	g / 100 g CP	0	0	100	2				66
Proline	Pro	g / 100 g CP	0	0	100	2				66
Serine	Ser	g / 100 g CP	0	0	100	2				66
Threonine	Thr	g / 100 g CP	0	0	100	2				66
Tryptophan	Trp	g / 100 g CP	0	0	100	2				66
Tyrosine	Tyr	g / 100 g CP	0	0	100	2				66
Valine	Val	g / 100 g CP	0	0	100	2				66

### 4. Fat

Parameter name	Abbreviation	Unit	FRC Std. value	Validation		Dec.	Calculations			
				Min	Max		Value	Recalculation	Mix	
Crude fat	CFat	g / kg DM	0,000001	0	1000	0		4;41;12;16;17;18;19;20;21;9;13,35	51	
Fatty acids	FA	g / kg CFat	0,000001	0	1000	0		16;17;18;19;20;21;9;13	56	
Fatty acids < C12	FA_C12	g / 100 g FA	0	0	100	1			1	57
Lauric acid	C12_0	g / 100 g FA	0	0	100	1			1	57
Myristic acid	C14_0	g / 100 g FA	0	0	100	1			1	57
Palmitic acid	C16_0	g / 100 g FA	0	0	100	1			1	57
Stearic acid	C18_0	g / 100 g FA	0	0	100	1			1	57
Oleic acid	C18_1	g / 100 g FA	0	0	100	1			1	57
Linoleic acid	C18_2	g / 100 g FA	0	0	100	1			1	57
Linolenic acid	C18_3	g / 100 g FA	0	0	100	1			1	57
Eicosapentaenoic acid	C20_5	g / 100 g FA	0	0	100	1			1	57
Docosahexaenoic acid	C22_6	g / 100 g FA	0	0	100	1			1	57
Other fatty acids	OFA	g / 100 g FA		0	100	1	1			57
Iodine value	IV	g I / 100 g FA	0	0	999	0	26			56

## 5. NDF

Parameter Name	Abbreviation	Unit	FRC Std. value	Validation		Dec.	Calculations		
				Min	Max		Value	Recalculation	Mix
NDF	NDF	g / kg DM	0	0	1000	0		33,4; 41;5;6;12;16;17;18; 19;20;21;9;13	51
Potentially degradable NDF	pdNDF	g / kg NDF		0	1000	0	2		53
Typed iNDF	TypiNDF	g/kg NDF		0	1000	0			49
iNDF	iNDF_DM	g/kg DM		0	1000	0			49
Indigestible NDF	iNDF	g / kg NDF	0	0	1000	0	49	2;5;16;17;18;19;20; 21;9;13	54
Typed kdNDF	TypkdNDF	% / hour	0	0	1000	0			33
Degradation rate, potentially degradable NDF	kdNDF	% / hour	0,000001	0	99	1	33	16;17;18;19;20;21; 9;13	50

## 6. Starch

Parameter name	Abbreviation	Unit	FRC Std. value	Validation		Dec.	Calculations		
				Min	Max		Value	Recalculation	Mix
Starch	ST	g / kg DM	0	0	1000	0		4;41;12;16;17; 18;19;20;21;9; 13	51
Soluble starch	sST	g / kg ST	0	0	1000	0		3;16;17;18;19; 20;21;9;13	52
Potentially degradable starch	pdST	g / kg ST	0	0	1000	0	3		53
Indigestible starch	iST	g / kg ST	0	0	1000	0		16;17;18;19; 20;21;9;13	54
Degradation rate, soluble starch	kdsST	% / hour	0,000001	0	999	0		16;17;18;19; 20;21;9;13	61
Degradation rate, potentially degradable starch	kdST	% / hour	0,000001	0	99	1		16;17;18;19; 20;21;9;13	50

## 7. Fermentation products feed

Parameter name	Abbreviation	Unit	FRC Std. value	Validation		Decimal	Calculations		
				Min	Max		Value	Recalculation	Mix
Fermentation products feed	FPF	g / kg DM	0	0	1000	0	15		51
Total acids	TAF	g / kg DM		0	1000	0	14		51
Lactic acid	LAF	g / kg DM	0	0	1000	0		14;15;4;41;6;12;16;17; 18;19;20;21;9;13	51
Acetic acid	ACF	g / kg DM	0	0	1000	0		14;15;4;41;6;12;16;17; 18;19;20;21;9;13	51
Propionic acid	PRF	g / kg DM	0	0	1000	0		14;15;4;41;6;12;16;17; 18;19;20;21;9;13	51
Butyric acid	BUF	g / kg DM	0	0	1000	0		14;15;4;41;6;12;16;17; 18;19;20;21;9;13	51
Alcohol	ALF	g / kg DM	0	0	1000	0		15;4;41;12;16;17;18;1 9;20;21;9;13	51
Formic acid	FOF	g / kg DM	0	0	1000	0		15;4;41;12;16;17;18;1 9;20;21;9;13	51

## 8. Rest Fraction

Parameter name	Abbreviation	Unit	AFI	FRC Std. value	Validation		Dec.	Calculations		
					Min	Max		Value	Recalculation	Mix
Rest fraction	RestCHO	g / kg DM			0	1000	0	4		51
Rest fraction corr	RestCHOcorr	g / kg DM			0	1000	0	12		51
Typed kdRestCHO	TypkdRestCHO	% / hour		0,000001	0	999	0		41	61
Degradation rate, rest fraction	kdRestCHO	% / hour		0,000001	0	999	0	41	16;17;18;19;20;21;9;13	61

## 9. Other Carbohydrates

Parameter name	Abbreviation	Unit	FRC Std. value	Validation		Dec.	Calculations		
				Min	Max		Value	Recalculation	Mix
Crude fiber	CF	g / kg DM	0	0	1000	0		35	51
Sugar	Sugar	g / kg DM	0,000001	0	1000	0		41;16;17;18;19;20;21;9;13,35	51
Pectin	Pectin	g / kg DM	0	0	1000	0			51
ADF	ADF	g / kg DM	0	0	1000	0			51
Lignin	ADL	g / kg DM	0	0	1000	0			51

## 10. Minerals

Parameter name	Abbreviation	Unit	FRC Std. value	Validation		Dec.	Calculations		
				Min	Max		Value	Recalculation	Mix
Calcium	Ca	g / kg DM	0	0	1000	1			51
Phosphorus	P	g / kg DM	0	0	1000	1			51
Magnesium	Mg	g / kg DM	0	0	1000	1			51
Potassium	K	g / kg DM	0	0	1000	1		7	51
Sodium	Na	g / kg DM	0	0	1000	1		7	51
Chloride	Cl	g / kg DM	0	0	1000	1		7	51
Sulfur	S	g / kg DM	0	0	1000	1		7	51
Cation anion balance	CAB	meq / kg DM		-	99999	0	7		51
Iron	Fe	mg / kg DM	0	0	999999	0			51
Manganese	Mn	mg / kg DM	0	0	999999	0			51
Zink	Zn	mg / kg DM	0	0	999999	0			51
Copper	Cu	mg / kg DM	0	0	999999	1			51
Cobalt	Co	mg / kg DM	0	0	999999	2			51
Selenium	Se	mg / kg DM	0	0	999999	2			51
Iodine	I	mg / kg DM	0	0	999999	2			51
Molybdenum	Mo	mg / kg DM	0	0	999999	2			51
Absorption coefficient of Calcium	acCa	g / kg Ca	0	0	1000	0			62
Absorption coefficient of Phosphorus	acP	g / kg P	0	0	1000	0			62
Absorption coefficient of Magnesium	acMg	g / kg Mg	0	0	1000	0			62

## 11. Vitamins

Parameter name	Abbreviation	Unit	FRC Std. value	Validation		Dec.	Calculations		
				Min	Max		Value	Recalculation	Mix
Vitamin A	VitA	1000 IU / kg DM	0	0	999999	0			51
Beta-carotene	b_car	mg / kg DM	0	0	9999	0			51
Vitamin D	VitD	1000 IU / kg DM	0	0	9999	0			51
Vitamin E	VitE	IU / kg DM	0	0	99999	0			51
Biotin	Biotin	mg / kg DM	0	0	1000000	1			51



## 12. Structure/fill value

Parameter name	Abbreviation	Unit	FRC Std. value	Validation		Dec.	Calculations		
				Min	Max		Value	Recalculation	Mix
Particle size	PS	mm	0	0	999	1		5;6	51
Chewing time index	Ci	Minutes / kg DM		0	999	0	5		51
Fill value lactation	FVL	FVL / kg DM		0	9	2	6		51

## 13. Standard feed values

Parameter name	Abbreviation	Unit	FRC Std. value	Validation		Dec.	Calculations		
				Min	Max		Value	Recalculation	Mix
AAT 8 kg DM	AATp8	g / kg DM				0	16		51
PBV 8 kg DM	PBVp8	g / kg DM				0	17		51
Net energy lactation 8 kg DM	NELp8	MJ / kg DM				2	18		51
AAT 20 kg DM	AATp20	g / kg DM				0	19		51
PBV 20 kg DM	PBVp20	g / kg DM				0	20		51
Net energy lactation 20 kg DM	NELp20	MJ / kg DM				2	21		51
NDF digestibility at 20kg DM	NDFD20	%		0	100	0	70		69
Histidin 20 kg DM	His20	% of AAT				1	43		68
Lysine 20 kg DM	Lys20	% of AAT				1	44		68
Methionine 20 kg DM	Met20	% of AAT				1	45		68
Organic matter digestibility at 8 kg DM	OMD8	% of OM		0	100	1	71		69
Organic matter digestibility at 20 kg DM	OMD20	% of OM		0	100	1	72		69
Total amount of digested organic matter at 8 kg DM	td_OM8	g/d		0	40000	1	73		51
Total amount of digested organic matter at 20 kg DM	td_OM20	g/d		0	40000	1	74		51

## 14. Prices

Parameter name	Abbreviation	Unit	FRC Std. value	Validation		Dec.	Calculations		
				Min	Max		Value	Recalculation	Mix
Price per kg	Price_Kg	Øre / kg		0	9999	1	13	9	63
Price per kg DM	Price_KgDM	Øre/kg DM		0	9999	1	22		51
Price per MJ (DM intake 20 kg)	Price_MJ_20	Øre / MJ		0	9999	1	9	13	64
Actual price per kg	PriceActual_Kg	Øre / kg		0	9999	1	23	25	63
Actual price per kg DM	PriceActual_Kg DM	Øre/kg DM		0	9999	1	24		51
Actual price per MJ (DM intake 20 kg)	PriceActual_MJ_20	Øre / MJ		0	9999	1	25	23	64

## 15. Previous national feed evaluation systems

Parameter name	Abbreviation	Unit	FRC Std. value	Validation		Dec.	Calculations		
				Min	Max		Value	Recalculation	Mix
Metabolizable energy (SE)	ME	MJ / kg DM	0			1			51
AAT (SE)	AAT_SE	g/kg DM		50	80	0			51
PBV (SE)	PBV_SE	g/kg DM		-100	250	0			51
ME_Horse (SE)	ME_Horse	MJ/kg DM				1			
Dig_CP (SE)	Dig_CP	g/kg DM				0			
Net energy (DK)	NE_original	FU/ kg DM	0			2	35		51

Kg dry matter per feed unit (DK)	DM_NE_original	kg DM/FU				2	36	35	
Kg per feed unit (DK)	kg_NE_original	kg/FU	0	0	25	2	37	35	
Net energy FE <sub>N</sub> (DK)	NE	FU / kg DM				2	38		51
Kg dry matter per feed unit FE <sub>N</sub> (DK)	DM_NE	kg DM/FU				2	39	38	
Kg per feed unit FE <sub>N</sub> (DK)	kg_NE	kg/FU				2	40	38	
Digestible crude protein (DK)	dCP_DK	g/FU	0	0	1000	1	30	35	
Net energy lactation (NO+IS)	NEL	FEm / kg DM	0	0	9	2			51
Gross energy	GE	MJ/kg DM		0	1000	1	42	11	51
AAT_FI	AAT_FI	g/kg DM	0	0	300	0			51
PBV_FI	PBV_FI	g/kg DM	0	-100	300	0			51
ME_FI	ME_FI	MJ/kg DM	0	0	30	1			51

## 16. Other parameters

Parameter name	Abbreviation	Unit	FRC Std. value	Validation		De c.	Calculations		
				Min	Max		Value	Recalc.	Mix
pH	pH	pH	7	0	14	2			59
ADF nitrogen	ADF_N	% of N	0	0	100	1			55
Clostridium tyrobutyricum spores	Cl_spo	log cfu/g	0	0		0			59
Clostridium tyrobutyricum spores in DM	Cl_spo_DM	Number/ g DM	0	0		0			59
Bacillus cereus spores	Ba_spo	Number/g	0	0		0			59
Bacillus cereus spores in DM	Ba_spo_DM	Number/g DM	0	0		0			51
Aerobic bacteria	AeBac	log cfu/g	0	0	1000	1			59
Lactic acid bacteria	LacBac	log cfu/g	0	0	1000	1			59
Gram negative bacteria	GnBac	log cfu/g	0	0	1000	1			59
Coliform bacteria	Coliform	log cfu/g	0	0	1000	1			59
Wateractivity	Wac	No unit	0	0	1000	2			59
Yeast	Yeast	log cfu/g	0	0	1000	1			59
Moulds	Moulds	log cfu/g	0	0	1000	1			59
Aspergillus fumigatus	Aspfum	log cfu/g	0	0	1000	0			59
Total germ	ToGe	log cfu/g	0	0	1000	0			59
Deoxynivalenol (Vomitoxin)	DON	µg/kg DM	0	0		0			51
Nivalenol	NIV	µg/kg DM	0	0		0			51
T-2 toxin	T2	µg/kg DM	0	0		0			51
HT-2 toxin	HT2	µg/kg DM	0	0		0			51
Summa T-2 + HT-2	SumT2_HT2	µg/kg DM	0	0		0			51
Zearalenone	ZEN	µg/kg DM	0	0		0			51
Ochratoxin A	OchA	µg/kg DM	0	0		1			51
Aflatoxin B1	AflaB1	µg/kg DM	0	0		1			51
Bacillus spores	BACSPOR_F	log cfu/g		0	1000	1			51
Enterobacteria	ENTERO_F	log cfu/g		0	1000	1			51
Infected kernels	INFKERN_F	%		0	100	0			51
Moulds, storage	MOSTOR_F	log cfu/g		0	1000	1			51
Nitrate	NO3	g/kg DM	0	0	100	1			51
Carbon sequestration in soil CO2e	C_soil	g/kg DM	0	-1000	5000	1			51
Land requirement	Land req	m2/kg DM	0	0	100	1			51

## 4. Feed Stuff Calculations

### 1: Other fatty acids

$$OFA = 100 - (FA\_C12 + C12\_0 + C14\_0 + C16\_0 + C18\_0 + C18\_1 + C18\_2 + C18\_3 + C20\_5 + C22\_6)$$

If FA = 0 then OFA = 0

### 2: Potentially degradable NDF

$$pdNDF = 1000 - iNDF$$

If NDF = 0 then pdNDF = 0

### 3: Potentially degradable starch

$$pdST = 1000 - sST$$

If ST = 0 then pdST = 0

### 4: Rest fraction:

$$restCHO = 1000 - Ash - CP - CFat - NDF - ST - FPF$$

### 5: Chewing time index (Ci):

$$Ci = Ei + Ri$$

Ei (Eating time index):

If ["PS" ≤ 6mm]:

$$Ei = 4$$

If [6 < "PS" ≤ 40mm]:

$$Ei = 0.5 \cdot \frac{NDF}{10} \cdot (1 - 0.52 \cdot e^{-0.078PS})$$

Where:

PS = Particle size (=Theoretical chopping length when Processing=Chopped)

If ["PS" > 40mm]:

$$Ei = 0.5 \cdot \frac{NDF}{10}$$

Ri (Ruminating time index):

If ["PS" ≤ 2mm]:

$$Ri = 0$$

If [2 mm < "PS" ≤ 40mm]:

$$Ri = \frac{NDF}{10} \cdot \left( 1 - e^{\left( -0.173 \left( \frac{PS}{0.7} - 1 \right) \right)} \right) \cdot \left( 0.75 + \left( \frac{iNDF}{1000} \right) \right)$$

Where:

PS = Particle size (=Theoretical chopping length when Processing=Chopped)

If ["PS" >40mm]:

$$Ri = \frac{NDF}{10} \cdot \left( 0.75 + \left( \frac{iNDF}{1000} \right) \right)$$

### 6: Fill value lactation (FVL):

If "PS" <= 6mm :

$$FVL = 0,22$$

If "PS" > 6mm and "FillValueCorrection" = false :

$$FVL = \frac{0,86 - OMD \cdot 0,005}{0,94 + 0,56 \cdot e^{-0,000029 \left( \frac{NDF}{10} \right)^{2,9}}}$$

If "PS" > 6mm and "FillValueCorrection" = true :

$$FVL = \frac{0,86 - OMD \cdot 0,005}{0,94 + 0,56 \cdot e^{-0,000029 \left( \frac{NDF}{10} \right)^{2,9}}} \cdot \left( 1 - \left( \frac{-0,000531 \cdot \left( (TAF)^2 - 6400 \right)}{100} + \frac{-4,765 \cdot \left( \ln(NH_3N) - \ln(50) \right)}{100} \right) \right)$$

### 7: Cation anion balance

$$CAB = \left( \left( \frac{K}{39,1} + \frac{Na}{23,0} \right) - \left( \frac{Cl}{35,5} + \frac{S}{16,0} \right) \right) \cdot 1000$$

### 8: Organic Matter

If "UreaCorrection" then

$$OM = 1000 - Ash - CP \cdot \frac{NH_3N}{2915} + \frac{NH_3N}{1000} \cdot \frac{CP}{6,25}$$

else

$$OM = 1000 - Ash$$

### 9: Price per MJ

If NELp20 = 0 or NaN then Price\_MJ\_20 = 0

Else

$$Price\_MJ\_20 = \frac{Price\_Kg \cdot 1000}{NELp20 \cdot DM}$$

### 10: Dry Matter Percentage

$$DM\_pct = \frac{DM}{10}$$

### 11: Crude protein corrected

$$CPcorr = \left(1 - \frac{NH_3N}{1000}\right) \cdot CP$$

### 12: Rest fraction corrected

If "UreaCorrection" then

$$restCHOCorr = 1000 - Ash - CPcorr - CP \cdot \frac{NH_3N}{2915} - CFat - NDF - ST - FPF$$

else

$$restCHOCorr = 1000 - Ash - CPcorr - \frac{CP}{6,25} \cdot \frac{NH_3N}{1000} - CFat - NDF - ST - FPF$$

### 13: Price per kg

$$Price\_Kg = Price\_MJ\_20 \cdot \frac{DM}{1000} \cdot NELp20$$

### 14. Total acids feed

$$TAF = LAF + ACF + PRF + BUF$$

### 15. Fermentation products feed

$$FPF = TAF + FOF + ALF$$

### 16. Calculation of Standard Feed Value AATp(8)

$$AATp = \text{InterfaceFRC}(8, \text{FeedStuff Id}, \text{AAT})$$

### 17. Calculation of Standard Feed Value PBVp(8)

$$PBVp = \text{InterfaceFRC}(8, \text{FeedStuff Id}, \text{PBV})$$

### 18. Calculation of Standard Feed Value NELp(8)

$$NELp = \text{InterfaceFRC}(8, \text{FeedStuff Id}, \text{NEL})$$

### 19. Calculation of Standard Feed Value AATp(20)

$$AATp = \text{InterfaceFRC}(20, \text{FeedStuff Id}, \text{AAT})$$

### 20. Calculation of Standard Feed Value PBVp(20)

$$PBVp = \text{InterfaceFRC}(20, \text{FeedStuff Id}, \text{PBV})$$

## 21. Calculation of Standard Feed Value NELp(20)

NELp = InterfaceFRC(20, FeedStuff Id, NEL)

## 22. Price per kg DM

$$Price\_KgDM = Price\_Kg \cdot \frac{1000}{DM}$$

## 23 Actual price per kg

$$PriceActual\_Kg = PriceActual\_MJ\_20 \cdot \frac{DM}{1000} \cdot NELp20$$

## 24. Actual Price per kg DM

$$PriceActual\_KgDM = PriceActual\_Kg \cdot \frac{1000}{DM}$$

## 25: Actual Price per MJ

If NELp20 = 0 or NaN then Price\_MJ\_20 = 0

Else

$$PriceActual\_MJ\_20 = \frac{PriceActual\_KgDM}{NELp20}$$

## 26. Iodine value

IV = (C18\_1\*89,8 + C18\_2\*2\*89,8 + C18\_3\*3\*89,8 + C20\_5\*5\*81,7 + C22\_6\*6\*75)/100

## 30 dCP\_DK

$$dCP\_DK = (CP \cdot 0.93 - 0.3) \cdot DM\_NE$$

## 31. OMD

If D\_value and IVOS and EFOS and VOS and OMDinvt = NaN then OMD = NaN

Else

If D\_value has a value AND IVOS does not have an analyzed value AND EFOS does not have an analyzed value AND VOS does not have an analyzed value AND OMDinvt does not have an analyzed value then

$$OMD = \frac{100 \cdot D\_value}{(1000 - Ash)}$$

Else

If IVOS has a value AND D\_value does not have an analyzed value AND EFOS does not have an analyzed value AND VOS does not have an analyzed value AND OMDinvt does not have an analyzed value then

If IVOScorrection then

$$OMD = 4.10 + 0.959 * IVOS$$

else

$$OMD = 6.73 + 0.950 * IVOS$$

If EFOS has a value AND D value does not have an analyzed value AND IVOS does not have an Analyzed value AND VOS does not have an analyzed value AND OMDinvit does not have an analyzed value then

If EFOScorrection then

$$\text{OMD} = 5.38 + 0.867 * \text{EFOS}$$

else

$$\text{OMD} = 46.2 + 0.433 * \text{EFOS}$$

If VOS has a value AND D value does not have an analyzed value AND IVOS does not have an analyzed value AND EFOS does not have an analyzed value AND OMDinvit does not have an analyzed value then

If VOSCorrection then

$$\text{OMD} = 0.62 * \text{VOS} + 23.0$$

else

$$\text{OMD} = 0.90 * \text{VOS} - 2.0$$

If OMDinvit has a value AND D value does not have an analyzed value AND IVOS does not have an analyzed value AND EFOS does not have an analyzed value AND VOS does not have an analyzed value then

$$\text{OMD} = \text{OMDinvit}$$

### 32. pdCP

If SumspdCP > 0 then

$$\text{pdCP} = \text{SumspdCP} - \text{sCP}$$

Else

$$\text{pdCP} = \text{NaN}$$

### 33. kdNDF

If TypkdNDF has a value then

$$\text{kdNDF} = \text{TypkdNDF}$$

Else

If NDF = 0 then

$$\text{kdNDF} = 0$$

Else

If PS > 6 then:

$$\text{kdNDF} = -3.475 + \frac{\sqrt{48.30 + \frac{46.37 \cdot D}{1 - D}}}{2}, \text{ where}$$

$$\text{NDS} = 1000 - \text{Ash} - \text{NDF}$$

$$\text{NDSFK} = (101,3 - (902/(\text{NDS}/10)))/100$$

$$\text{uOM} = (1000 - \text{Ash}) * (1 - \text{OMD}/100)$$

$$\text{uNDS} = \text{NDS} * (1 - \text{NDSFK})$$



$uNDF = uOM - uNDS$   
 $NDF_{FK} = (NDF - uNDF)/NDF$   
 $D = NDF_{FK}/(pdNDF_{corr}/1000)$   
 $pdNDF_{corr} = 1000 - iNDF$

Else kdNDF = NaN

### 34. Amino acids

If Ala and Arg and Asp etc. have a value then

$AAN = 6,25 \cdot (0,1572 \cdot Ala + 0,3216 \cdot Arg + 0,1052 \cdot Asp + 0,1156 \cdot Cys + 0,0952 \cdot Glu + 0,1866 \cdot Gly + 0,2708 \cdot His + 0,1068 \cdot Ile + 0,1068 \cdot Leu + 0,1916 \cdot Lys + 0,0939 \cdot Met + 0,0848 \cdot Phe + 0,1217 \cdot Pro + 0,1333 \cdot Ser + 0,1176 \cdot Thr + 0,1372 \cdot Trp + 0,0773 \cdot Tyr + 0,1196 \cdot Val)$

Else

AAN = AAN\_Typed

### 35. Net energy, NE\_original (DK)

If OM > 0 and NH3-N < 1000 then

If Sugar <= 200 then

$NE_{original} =$

$$\left( -0.369 + 0.0989 \cdot \left( +17.3 \cdot \left( \frac{OMD}{100} \cdot \frac{1000 - Ash}{1000} - (0.93 \cdot CP - 30)/1000 - (0.96 \cdot CFat - 10)/1000 \right) \right) - 0.347 \cdot \frac{CF}{1000} \right)$$

Else

$NE_{original} =$

$$\left( -0.369 + 0.0989 \cdot \left( +17.3 \cdot \left( \frac{OMD}{100} \cdot \frac{1000 - Ash}{1000} - (0.93 \cdot CP - 30)/1000 - (0.96 \cdot CFat - 10)/1000 \right) \right) - 0.766 \cdot \left( \frac{Sugar}{1000} \right) - 0.347 \cdot \frac{CF}{1000} \right)$$

### 36. dry matter per net energy, DM\_NE\_original (DK)

$$DM_{NE\_original} = \frac{1}{NE_{original}}$$

### 37. kg per net energy, kg\_NE\_original (DK)

$$kg\_NE\_original = \frac{DM\_NE\_original \cdot 1000}{DM}$$

### 38. Net energy, FE<sub>N</sub> (DK)

$$NE = NELp20/7.43$$

### 39. Dry matter per Net energy, FE<sub>N</sub> (DK)

$$DM\_NE = \frac{1}{NE}$$

### 40. kg per Net energy, FE<sub>N</sub> (DK)

$$kg\_NE = \frac{DM\_NE * 1000}{DM}$$

### 41. kdRestCHO

If TypkdRestCHO has a value then

$$kdRestCHO = TypkdRestCHO$$

Else

If RestCHO = 0 then

$$kdRestCHO = 0$$

Else

$$kd\ RestCHO = \left(1 - \frac{Sugar}{RestCHO}\right) \cdot 10 + \left(\frac{Sugar}{RestCHO}\right) \cdot 150$$

if Sugar > RestCHO then kdRestCHO = 150

$$42. GE = \frac{24.1 \cdot CPcorr + 36.6 \cdot CFat + 18.5 \cdot \left(1000 - Ash - CPcorr - CFat - \frac{CP}{6.25} \cdot \frac{NH3N}{1000}\right)}{1000}$$

### 43. Calculation of Standard Feed Value His(20)

$$His = InterfaceFRC(20, FeedStuff Id, His\_AAT)$$

### 44. Calculation of Standard Feed Value Lys(20)

$$Lys = InterfaceFRC(20, FeedStuff Id, Lys\_AAT)$$

### 45. Calculation of Standard Feed Value Met(20)

$$Met = InterfaceFRC(20, FeedStuff Id, Met\_AAT)$$

### 46. Calculation of Standard Feed Value Histidin(20)

$$Histidine = InterfaceFRC(20, FeedStuff Id, Histidine)$$

### 47. Calculation of Standard Feed Value Lysine(20)

$$Lysine = InterfaceFRC(20, FeedStuff Id, Lysine)$$

### 48. Calculation of Standard Feed Value Methionine(20)

*Methionine* = InterfaceFRC(20, FeedStuff Id, Methionine)

#### 49 iNDF

if iNDF\_DM has a value

then

$$iNDF = \frac{iNDF\_DM \cdot 1000}{NDF}$$

if TypiNDFhas a value

then

$$iNDF = TypiNDF$$

else

If VOScorrection= "true"

$$iNDF = \frac{940 - 10.6 \times OMD - 0.517 \times Ash}{NDF} \times 1000$$

Elseif VOScorrection= "false"

$$iNDF = \frac{506 - 5.60 \times OMD - 0.159 \times Ash}{NDF} \times 1000$$

exception

if iNDF <= 20/ NDF\*1000 then iNDF = 1000\*20/ NDF

## 5. Feed mixture calculations

### 50. Degradation rate of pdCP. pdNDF or pdST

If kdXX<sub>i</sub> = 0 then exclude from calculations

$$kd_a XX = \frac{kp}{\left( \frac{\sum_i \left( Share_i \cdot XX_i \cdot \frac{pdXX_i}{1000} \right)}{\sum_i \left( \left( Share_i \cdot XX_i \cdot \frac{pdXX_i}{1000} \right) / \left( 1 + \frac{kp}{kdXX_i} \right) \right)} \right)^{-1}}$$

Where:

- XX<sub>i</sub> is either CP. NDF or ST for the i = 1.....n`th feedstuff
- kp = 3.3373 if CP or ST
- kp = 2.8701 if NDF
- $Share_i = \frac{kgDM_i}{\sum_i kgDM_i}$

### 51. Aggregated content of a feed fraction in a feed mixture

$$XX_a = \sum_i XX_i \cdot Share_i$$

Where:

- XX<sub>i</sub> is a feed fraction expressed in units per kg DM for the i = 1.....n`th feedstuff
- $Share_i = \frac{kgDM_i}{\sum_i kgDM_i}$

**52. Aggregated content of soluble CP or ST in a feed mixture**

$$sXX_a = \frac{\sum_i (Share_i \cdot XX_i \cdot sXX_i)}{XX_a}$$

Where:

- $XX_i$  is either CP or ST for the  $i = 1 \dots n$ th feedstuff
- $Share_i = \frac{kgDM_i}{\sum_i kgDM_i}$

**53. Aggregated content of potentially degradable CP. ST or NDF or SumspdCP in a feed mixture**

$$pdXX_a = \frac{\sum_i (Share_i \cdot XX_i \cdot pdXX_i)}{XX_a}$$

Where:

- $XX_i$  is either CP. ST or NDF for the  $i = 1 \dots n$ th feedstuff
- $Share_i = \frac{kgDM_i}{\sum_i kgDM_i}$

**54. Aggregated content of indigestible CP. ST or NDF (iCP. iST. iNDF, TypiNDF) in a feed mixture.**

$$iXX_a = \frac{\sum_i (Share_i \cdot XX_i \cdot iXX_i)}{XX_a}$$

Where:

- $XX_i$  is either CP. ST or NDF for the  $i = 1 \dots n$ th feedstuff
- $Share_i = \frac{kgDM_i}{\sum_i kgDM_i}$

**55. Aggregated content of  $NH_3N$ . sAAN. sPeN or sPN. SumspdCP and ADF-N in a feed mixture**

$$XX_a - N = \frac{\sum_i (Share_i \cdot CP_i \cdot XX_i)}{CP_a}$$

Where:

- $XX_i$  is either  $NH_3N$ . sAAN. sPeN. sPN. or ADF-N for the  $i = 1 \dots n$ th feedstuff
- $Share_i = \frac{kgDM_i}{\sum_i kgDM_i}$

**56. Aggregated content of fatty acids and iodine value in a feed mixture**

$$XX_{FA_a} = \frac{\sum_i (Share_i \cdot XX_i \cdot CFat_i)}{CFat_a}$$

Where:

- $XX_i$  is either CFat or iodine value for the  $i = 1 \dots n$ th feedstuff
- $Share_i = \frac{kgDM_i}{\sum_i kgDM_i}$

**57. Aggregated content of individual fatty acids (FA\_C12. C12\_0. C14\_0. etc.) of FA in a feed mixture**

$$XX_{IFA_a} = \frac{\sum_i (Share_i \cdot FA_i \cdot CFat_i \cdot XX_i)}{XX_{FA_a} \cdot CFat_a}$$

Where:

- $XX_i$  is either FA\_C12. C12\_0. C14\_0.....OFA for the  $i = 1 \dots n$ th feedstuff
- $Share_i = \frac{kgDM_i}{\sum_i kgDM_i}$

**58. Aggregated Organic Matter Digestibility. IVOS. EFOS. VOS. OMDin vitro in a feed mixture**

$$XX_a = \frac{\sum_i (Share_i \cdot OM_i \cdot XX_i)}{OM_a}$$

Where:

- $XX_i$  is either IVOS. EFOS. VOS. OMDin vitro for the  $i = 1 \dots n$ th feedstuff
- $Share_i = \frac{kgDM_i}{\sum_i kgDM_i}$  for the  $i = 1 \dots n$ th feedstuff

**59. Aggregated content of dry matter or parameters expressed in units per gram or kg in a feed mixture**

$$XX_a = \frac{\sum_i \left( \frac{kgDM_i}{DM_i} \right) \cdot XX_i}{\sum_i \frac{kgDM_i}{DM_i}}$$

Where  $XX_i$  is either pH. aerobic bacteria. yeast. moulds. total germ. etc.

**60. Dry Matter Percentage in a feed mixture**

$$DM\_pct_a = \frac{\sum_i kgDM_i}{\sum_i kgDM_i \cdot 10 / DM_i}$$

### 61. Degradation rate of sCP, sST and RestCHOcorr

If  $kdsXX_i = 0$  then exclude from calculations

$$kd_aXX = \frac{kp}{\left( \frac{\sum_i \left( Share_i \cdot XX_i \cdot \frac{sXX_i}{1000} \right)}{\sum_i \left( \left( \frac{Share_i \cdot XX_i \cdot \frac{sXX_i}{1000}}{1 + \frac{kp}{kdsXX_i}} \right) \right)} \right) - 1}$$

Where:

- $XX_i$  is either CP, ST or RestCHOcorr for the  $i = 1 \dots n$ th feedstuff
- $sXX_i$  is either sCP, sST or RestCHOcorr for the  $i = 1 \dots n$ th feedstuff
- $kdsXX_i$  is either  $kdsCP$ ,  $kdsST$  or  $kdRestCHO$  for the  $i = 1 \dots n$ th feedstuff
- $kp = 7.0794$
- $Share_i = \frac{kgDM_i}{\sum_i kgDM_i}$

### 62. Aggregated absorption coefficient of Ca, P or Mg in a feed mixture

$$acXX_a = \frac{\sum_i (Share_i \cdot XX_i \cdot acXX_i)}{XX_a}$$

Where:

- $XX_i$  is either Ca, P or Mg for the  $i = 1 \dots n$ th feedstuff
- $Share_i = \frac{kgDM_i}{\sum_i kgDM_i}$

### 63. Aggregated price per kg

$$Price\_kg_a = \frac{\sum_i \left( \frac{kgDM_i \cdot 1000}{DM_i} \right) \cdot Price\_kg_i}{\sum_i \frac{kgDM_i \cdot 1000}{DM_i}} + Mix\_cost$$

### 63. Aggregated actual price per kg

$$PriceActual\_kg_a = \frac{\sum_i \left( \frac{kgDM_i \cdot 1000}{DM_i} \right) \cdot X_i}{\sum_i \frac{kgDM_i \cdot 1000}{DM_i}} + Mix\_cost$$

#### 64. Aggregated price per MJ<sub>20</sub>

$$Price\_MJ\_20_a = \frac{Price\_kg_a \cdot 1000}{NELp\_20_a \cdot DM_a}$$

#### 64. Aggregated actual price per MJ<sub>20</sub>

$$PriceActual\_MJ\_20_a = \frac{PriceActual\_Kg\_DM_a}{NELp20_a}$$

#### 65. Aggregated dry matter

$$XX_a = \frac{\sum_i kgDM_i}{\sum_i kgDM_i / XX_i}$$

Where XX<sub>i</sub> is DM for the i = 1.....n`th feedstuff

#### 66. Aggregated content of AAN. AAN\_Typed and amino acids (Ala. Arg. Asp. etc.) in a feed mixture

$$XX_a\_N = \sum_i (Share_i \cdot XX_i)$$

Where:

- XX<sub>i</sub> is either AAN or amino acids (Ala. Arg. Asp. etc.) for the i = 1.....n`th feedstuff

$$Share_i = \frac{kgDM_i \cdot CP_i \cdot \left( 1 - \frac{sCP_i \cdot 150}{1000 \cdot 150 + r\_kpl} - \frac{NH_3N_i}{1000} + \frac{NH_3N_i}{1000} \cdot \frac{150}{150 + r\_kpl} \right) - \frac{pdCP_i \cdot kdCP_i}{1000 \cdot kdCP_i + r\_kp}}{\sum_i kgDM_i \cdot CP_i \cdot \left( 1 - \frac{sCP_i \cdot 150}{1000 \cdot 150 + r\_kpl} - \frac{NH_3N_i}{1000} + \frac{NH_3N_i}{1000} \cdot \frac{150}{150 + r\_kpl} \right) - \frac{pdCP_i \cdot kdCP_i}{1000 \cdot kdCP_i + r\_kp}}$$

where r<sub>kpl</sub> = 7.0794 and r<sub>kp</sub> = 3.3373 for for the i=1...n`th feedstuff

### 67. Aggregated actual price per kg DM

$$PriceActual\_KgDM_a = \frac{PriceActual\_Kg_a}{DM_a} \cdot 1000$$

### 68. Aggregated content of standard feed value of His20, Lys20 and Met20

$$XX20\_a = \frac{\sum_i (Share_i \cdot XX20_i \cdot AATp20_i)}{AATp20\_a}$$

Where:

- $XX20_i$  is either His20, Ly20 or Met20 for the  $i = 1, \dots, n$ th feedstuff
- $Share_i = \frac{kgDM_i}{\sum_i kgDM_i}$

### 69. Aggregated NDF Digestibility. in a feed mixture

$$NDFD_a = \frac{\sum_i (Share_i \cdot NDF_i \cdot NDFD_i)}{NDF_a} \quad \text{where} \quad Share_i = \frac{kgDM_i}{\sum_i kgDM_i} \quad \text{for the } i = 1, \dots, n \text{th feedstuff}$$

$$OMD8_a = \frac{\sum_i (Share_i \cdot OM_i \cdot OMD_i)}{OM_a}$$

$$Share_i = \frac{kgDM_i}{\sum_i kgDM_i} \quad \text{for the } i = 1, \dots, n \text{th feedstuff}$$

$$OMD20_a = \frac{\sum_i (Share_i \cdot OM_i \cdot OMD_i)}{OM_a}$$

$$Share_i = \frac{kgDM_i}{\sum_i kgDM_i} \quad \text{for the } i = 1, \dots, n \text{th feedstuff}$$

### 70 Calculation of Standard Feed Value NDFD20

$$NDFD20 = InterfaceFRC(20, FeedStuff Id, NDFD)$$

### 71 Calculation of Standard Feed Value OMD8

$$OMD8 = InterfaceFRC(8, FeedStuff Id, OMD)$$

### 72 Calculation of Standard Feed Value OMD20

$$OMD20 = InterfaceFRC(20, FeedStuff Id, OMD)$$



**73 Calculation of Standard Feed Value td\_OMD8**

$td_{OM8} = \text{InterfaceFRC}(8, \text{FeedStuff Id}, td_{OM})$

**74 Calculation of Standard Feed Value td\_OMD20**

$td_{OM20} = \text{InterfaceFRC}(20, \text{FeedStuff Id}, td_{OM})$

## 8. Basic data

Basic data is needed for setting the right values in the Analyses Feedstuff dataset used in the interface to FAS. Basic data consists of different pick list for choosing for example the right Silage additive.

### 8.1 Silage additives

Names in English

ID	Name	CountryID (NorFor= all countries)
1	No additive	NorFor
2	Sila-Bac <sup>®</sup> Stabilizer TM - Granulat	DK
3	Sila-Bac <sup>®</sup> Stabilizer TM - Flydende	DK
4	Lactisil <sup>®</sup> 200 NB	NorFor
5	Feedtech Silage F22	DK
6	Majs Kofasil Liquid	DK
7	Kofasil Liquid	DK
8	Kofasil Bale	DK
9	AGROS HI-DRI	DK
10	DoubleAction ECOCORN – Flydende	DK
11	DoubleAction ECOCORN - Granulat	DK
12	ECOSYL 66 – Flydende	DK
13	ECOSYL 66 – Granulat	DK
14	BIOMAX	DK
16	Sila-Bac <sup>®</sup> - Flydende	DK
17	Sila-Bac <sup>®</sup> - Granulat	DK
18	Siloferm	NorFor
19	Sil-All 4x4TM	NorFor
20	AGROS CLAMP	DK
21	AIV Pro	DK
22	AIV Green	DK
23	Feedtech Silage F3000	DK
24	AIV Bioprofit	DK
25	AIV Lactofast	DK
26	Lactisil <sup>®</sup> 200	DK
27	Sil-All Fireguard <sup>™</sup>	DK
28	Propionsyra 99%	SE
29	Myrsyra 85%	SE
30	Formic Acid	NorFor
31	Ättiksyra	SE
32	Kofasil Ultra	NorFor
33	ProMyr TMR Flexible	SE
34	ProMyr TMR Solid	SE

35	ProMyr TMR Standard	SE
36	Bonsilage FIT M	SE
37	Josilac	NorFor
38	Bonsilage Plus	NorFor
39	Bonsilage Forte	SE
40	Beetpulp	NorFor
41	Molasses	NorFor
42	Bonsilage FIT G	SE
43	Kofa Plus	NorFor
44	GrasAAT Plus	NO
45	Howden silovæske	NO
46	Ensimax	NorFor
47	Biomax R	NO
48	Kofasil LP	NO
49	Feedtech Silage II	NO
50	FCN-Silage 2000	NO
51	Ensil 1	NO
52	GrasAAT Eco	NO
53	GrasAAT Lacto	NO
54	Other additives	NorFor
55	Kofasil Life	DK
56	Kofasil Life M	DK
57	Biomax GP	DK
58	Biomax 5	DK
62	Bonsilage SPEED G	SE
63	Bonsilage SPEED M	SE
64	Kofasil Ultra	SE
65	Kofasil Combi	SE
66	Kofasil Duo	SE
67	ProMyr NT570	SE
68	ProMyr XR680	SE
69	Helm Grass	SE
70	Helm propionsyra	SE
71	Helm Majs	SE
72	Kofasil Lac	SE
73	Kofasil Life	SE
74	Kofasil Life M	SE
75	Kofasil Lp	SE
76	Kofasil S	SE
77	Kofasil Stabil	SE
78	Ensil Pluss	NO
79	Bonsilage Græs	DK
80	Feedtech Silage F10	DK

81	Feedtech Silage F18	DK
82	Kofasil LAC	DK
84	Bonsilage Majs	DK
85	Ikke oplyst	DK
86	Lalsil PS	DK
87	Kofa Grain pH5	DK
88	Bonsilage Plus	DK
89	Lalsil Dry	DK
90	Lalsil Fresh	DK
91	AKM 400	DK
92	Biomax Stabil	DK
93	Biomax Øko Stabil	DK
94	Biomax Øko	DK
95	PropioLiin 50	DK
96	Kofasil Stabil	DK
97	Lalsil CL	DK
98	Powerstart Instant	DK
100	PropioLiin	DK
101	Sil-All 4x4 FVA	DK
102	Førsil Pluss	NO
103	Kofasil Combi	NO
104	Kofasil S	DK
105	Feedtech Silage F400	DK
106	Animal Biosa ensilering	NO
107	Biomax GP	NO
108	Bio-Sil	NO
109	EM Silage	NO
110	Feedtech Silage F 3000	NO
111	Kofasil LAC	NO
112	Kofasil Life	NO
113	Førsil	NO
114	Sil-All Fireguard	NO
115	Sil-All FVA	NO
116	Sil-All FVA	NO
117	SiloSolve EF	DK
118	SiloSolve MC	DK
119	SiloSolve AS 250	DK
120	SiloSolve AS 200	DK
121	SiloSolve AS 100	DK
122	Kofasil Duo	DK
123	Kofasil COMBI	DK
124	Biomax BioStabil Majs	DK
125	Biomax BioStabil Plus	DK

126	Biomin BioStabil Wraps	DK
127	EcoSyl 50 organic	SE
128	EcoSyl 50	SE
129	Josilac extra	SE
130	Josilac ferm	SE
131	SoftAcid P+	SE
132	SafeSil Bio	SE
133	SafeSil Challenge	SE
134	SafeSil Pro	SE
135	SolvEns M	SE
136	SiloSolve FC	SE
137	SiloSolve MC	SE
138	SiloSolve OS	SE
139	SolvEns PMR Stabil	SE
140	SiloSolve Eko	SE
141	SolvEns Vall	SE
142	BioStabil Plus	SE
143	BioStabil Mays	SE
144	BioStabil Mays HC	SE
145	BioStabil Plus HC	SE
146	Natriumbenzoat	DK
147	Propcorn	DK
148	Propcorn NC	DK
149	Advance Majs	DK
150	Advance Helsæd	DK
151	Advance Extra græs	DK
152	Advance Lucerne	DK
153	Maize-All	DK
154	Kofasil ULTRA New	DK
155	Biotal axcool gold	DK
156	Krimpersile Blå	DK
157	Krimpersile Grøn	DK
158	Propionsyre	DK
159	Propionsyre Ekstra	DK
160	XL-Sile	DK
161	SiloSolve OS	DK
162	Lalsil combo HC	DK
163	Kemira AIV 2000 PLUS	DK
164	XTRASIL Bio LP	SE
165	XTRASIL Bio Ultra	SE
166	XTRASIL Bio Majs	SE
167	XTRASIL LP	SE
168	XTRASIL Ultra HD	SE

169	XTRASIL Majs HD	SE
170	XTRASIL Stabilizer	SE
171	Lalsil Dry	SE
172	Lalsil Dry HC Organic	SE
173	Josilac grass	NorFor
174	Josilac combi	NorFor
175	Josilac classic	NorFor
176	Lalsil Dry Fresh	SE
177	DA Ecocorn	SE
178	DA Ecostable	SE
179	Hyprasil Green+	SE
180	ProSid MI700	SE
181	Konsil MP	SE
182	GrasAAT Grain	SE
183	GrasAAT SP	SE
184	GrasAAT SX	SE
185	Fylax Forte-HC liquid	DK
188	Krimpersile grøn	Island
189	Lalsil CL HC	DK
191	Lalsil Dry HC	DK
192	Lalsil Fresh HC	DK
193	Lalsil PS HC	DK
194	MyrproLiin	DK
195	Pioneer 1188	DK
196	Pioneer 11A44	DK
197	Pioneer 11G22	DK
200	Selko -BE+	DK
201	Selko CORN NC	DK
202	Sil-All Maize + FVA	DK
203	SiloSolve FC	DK
205	Andre ensileringsmidler	DK
206	Ecosyl 100	DK
207	Ecocool Græs	DK
208	Ecocool Majs	DK
209	Feedtech Silage M25AS	DK
210	Feedtech Silage M60	DK
211	Biotal axcool gold	DK
212	Lalsil Dry	NO
213	GrasAAT sx	NO
214	Ensil Ekstra	NO
215	Xtrasil LP	NO
216	Xtrasil Ultra	NO
217	Xtrasil Bio-Lp	NO

218	Konsil LP	SE
219	Konsil Majs HD	SE
220	Konsil MPE/Pro7	SE
221	Konsil Ultra	SE
222	THORSIL HAMMER	SE
223	THORSIL MAIZE	SE
224	THORSIL SKY	SE
225	THORSIL THUNDER	SE
226	Topsil Max	SE
227	Topsil Stabil	SE

## 8.2 Storage Types

Names in English. Swedish. Danish. Norwegian, Icelandic, German, Italian and Romanian

<b>Id</b>	<b>Name</b>	<b>NorwegianName</b>	<b>SwedishName</b>	<b>DanishName</b>	<b>IcelandicName</b>
6	Bunker silo	Plansilo	Plansilo	Plansilo	Flatgyfja
7	Stack silo. field	Stakksilo på jordet	Limpa på mark	Markstak	Stæða á jörð
8	Stack silo. floor	Stakksilo på plate	Limpa på platta	Betonplads	Stæða á gólfi
9	Tower silo	Tårnsilo	Tornsilo	Tårnsilo	Turn
10	Individual wrapped bales	Baller pakket enkeltvis	Storbal	Wrapballe	Rúllubaggar
11	Tubular wrapped bales	Baller pakket sammen	Storbal i tub	Wrappølser	Rúllur pakkaðar saman í lengju
12	Bagged silage	Pølsesilo	Slang	Storpose	Pylsuvothey

<b>Id</b>	<b>Name</b>	<b>GermanName</b>	<b>ItalianName</b>	<b>RomanianName</b>
6	Bunker silo	Bunkersilo	Trincea	Siloz buncăr
7	Stack silo. field	Fahrsilo, unbefestigt	Stack silo, field	Siloz de suprafață, orizontal pe pământ
8	Stack silo. floor	Fahrsilo, befestigt	Stack silo, floor	Siloz de suprafață, orizontal pe beton
9	Tower silo	Hochsilo	Silo a torre	Siloz turn
10	Individual wrapped bales	Siloballen	Rotoballe fasciate	Baloți înfoliați individual
11	Tubular wrapped bales	Bunkersilo	Trincea	Siloz buncăr
12	Bagged silage	Fahrsilo, unbefestigt	Stack silo, field	Siloz de suprafață, orizontal pe pământ

## 8.3 Status

Names in English

<b>Id</b>	<b>Name</b>
1	Completed
2	Being Analysed
3	Cancelled



## 8.4 AnalysisMethod

Names in English

Id	Name	Description
	CHEM	Other chemical method
	DRYICP	NMKL No 139 1991, modified
	MWICP	Wet... in microwave and ICP NMKL no 161 1998, modified
	NIR	Near Infrared Reflection
	NIT	Near Infrared Transmission
	REF	Reference method
	REFMOD	Reference method modified
	WETICP	Wet... and ICP NMKL no 161 1998, modified

## 8.5 ReferenceMethod

Names in English. Rows with red text does not exist in NorFor Admin Tool (19/10 2020)

Id	Name	Description
1	EC 152/2009	Dry matter in concentrate
2	NorFor (2011)	Dry matter in forage
3	71/250/EEC	Ash
4	93/28/EEC	Crude protein
5	Dumas	Crude protein
6	MgO-method	Ammonia
7	Enzyme-method	Ammonia
8	AutoAnalyzer	Ammonia
9	98/64/EC	Crude fat
10	ISO/CD 16472	NDF
11	Knudsen (1997)	Starch
12	Åman & Hesselman (1984)	Starch
13	Larsson & Bengtsson (1983)	Starch
14	ISO 15914:2004	Starch
15	HPLC	Fermentation products feeds
16	GC	Fermentation products feeds
17	Titration	Fermentation products feeds
18	92/89/EEC	Crude fibre
19	71/250/EEC	Sugar
20	HPLC	Ethanol
21	GC	Ethanol
22	Tilley & Terry (1963)	In vitro rumen fluid organic matter solubility
23	EFOS	In vitro enzyme organic matter solubility
24	Lindgren (1979. 1983. 1988)	VOS
25	Tilley & Terry (1963)	Rumen fluid in vitro organic matter digestibility
26	71/250/EEC	Calcium
27	71/393/EEC	Phosphorus
28	73/46/EEC	Magnesium
29	71/250/EEC	Potassium

30	71/250/EEC	Sodium
31	71/250/EEC	Chloride
32	??	Sulfur
33	78/633/EEC	Iron
34	78/633/EEC	Manganese
35	78/633/EEC	Zink
36	78/633/EEC	Copper
37	78/633/EEC	Cobalt
38	??	Selenium
39	??	Iodine
	DM	Dry and Weigh
	NMKL 168/2001	WACT
	NMKL 86-3/1999	TOTBACT
	NMKL 98	YEAST
	SS 028167-1	COLI
	SUGAR_EK	SUGAR_EK

## 8.6 Connection between AnalyseMethod & ReferenceMethod

AnalyseMethodID	ReferenceMethodID
1	5
1	6
1	7
1	8
1	9
1	10
1	11
1	12
1	13
1	14
1	15
1	16
1	17
1	18
1	19
1	20
1	21
1	22
1	23
1	24
1	25
2	1
2	4
2	18
3	26
3	27

## 8.7 Varieties

Names in English

### Græsblandinger

Id	Name	CountryID (NorFor = all countries)
20	Græsblanding 20	DK
21	Græsblanding 21	DK
22	Græsblanding 22	DK
23	Græsblanding 23	DK
24	Græsblanding 24	DK
25	Græsblanding 25	DK
26	Græsblanding 26	DK
31	Græsblanding 31	DK
32	Græsblanding 32	DK
33	Græsblanding 33	DK
34	Græsblanding 34	DK
939	Græsblanding 35	DK
1034	Græsblanding 36	DK
41	Græsblanding 41	DK
42	Græsblanding 42	DK
43	Græsblanding 43	DK
44	Græsblanding 44	DK
45	Græsblanding 45	DK
940	Græsblanding 46	DK
1035	Græsblanding 47	DK
1036	Græsblanding 48	DK
49	Græsblanding 49	DK
954	Græsblanding Ø20	DK
953	Morsø 2	DK
1037	Strandsvingel baseret græsblanding	DK
941	Sydvestjyden	DK

### Italiensk rajgræs

Id	Name	CountryID (NorFor = all countries)

### Hybridrajgræs

Id	Name	CountryID (NorFor = all countries)
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### Barley

Id	Name	CountryID (NorFor = all countries)
925	Barabas	DK
156	Barke	DK
271	Brazil	DK
272	Class	DK
226	Helium	DK
227	Hydrogen	DK
274	Power	DK
177	Prestige	DK
926	Scandium	DK
275	Sebastian	DK
252	Simba	DK

488	Sortsblanding	DK
224	Troon	DK

### Wheat

<b>Id</b>	<b>Name</b>	<b>CountryID (NorFor = all countries)</b>
239	Abika	DK
176	Hattrick	DK
235	Opus	DK
236	Patrel	DK
255	Robigus	DK
237	Skalmeje	DK
238	Smuggler	DK

### Rye

<b>Id</b>	<b>Name</b>	<b>CountryID (NorFor = all countries)</b>

### Triticale

<b>Id</b>	<b>Name</b>	<b>CountryID (NorFor = all countries)</b>

### Oat

<b>Id</b>	<b>Name</b>	<b>CountryID (NorFor = all countries)</b>

### Peas

<b>Id</b>	<b>Name</b>	<b>CountryID (NorFor = all countries)</b>
119	Athos	DK
216	Attika	DK
927	Exclusive	DK
928	Hector	DK
196	Javlo	DK
259	Lexus	DK
172	Pinochio	DK

### Maize

<b>Id</b>	<b>Name</b>	<b>CountryID</b>	<b>Id</b>	<b>Name</b>	<b>CountryID</b>
934	Aastar	DK	972	Kontender	DK
1020	Absalon	DK	1029	Kubitus	DK
970	Activate	DK	232	Kwiss	DK
225	Adenzo	DK	1008	Leovoxx	DK
937	Adept	DK	1026	LG30209	DK
938	ADV 4110	DK	967	LG30211	DK
1017	Alfastar	DK	1015	LG30223	DK
990	Amagrano	DK	1010	LG30240	DK
975	Ambition	DK	1044	LG31211	DK
948	Ambrosini	DK	1045	LG31218	DK
957	Ampezzo	DK	962	LG3181	DK
282	Anjou 209	DK	230	LG3214	DK
260	Anjou 219	DK	995	Lidano	DK

240	Anvil	DK	1009	Martinez KWS	DK
947	Aphrodite	DK	1016	MAS 16V	DK
981	Arcade	DK	950	MAS 209	DK
966	Aritzto	DK	969	Mixture	DK
963	Artist	DK	979	Monty	DK
1025	Asgaard	DK	221	Nescio	DK
949	Astiano	DK	968	Nitro	DK
946	Atrium	DK	233	NK Bull	DK
996	Augustus KWS	DK	956	NK Jasmic	DK
1040	Aurelius KWS	DK	1011	Oberst	DK
1041	Autens KWS	DK	961	Ormeau	DK
179	Avenir	DK	1019	Osterbi CS	DK
933	Award	DK	1012	P7524	DK
958	Azelo	DK	1004	P7892	DK
754	Banguy	DK	944	Paddy	DK
951	Beacon	DK	174	Passat	DK
936	Beethoven	DK	234	Patrick	DK
241	Blixxem	DK	943	Pavarotti	DK
171	Buxxil	DK	959	Podium	DK
1023	Cathy	DK	992	PR39V43	DK
242	Cerruti	DK	974	Ramirez	DK
942	Chalice	DK	1031	Ramses	DK
960	Chavoxx	DK	263	Ravenna	DK
929	Claxxon	DK	1046	Reason	DK
1018	Coditank	DK	1033	RGT Norvixx	DK
262	Companero	DK	1039	RGT Owwgood	DK
169	Crescendo	DK	1002	RGT Sharxx	DK
229	Destiny	DK	231	Rhapsody	DK
1007	DKC 3333	DK	264	Rosalie	DK
1042	Edgar KWS	DK	1028	Rubiera KWS	DK
971	Emblem	DK	1049	SA1423	DK
1032	Emmerson	DK	1022	Salerno KWS	DK
1024	Emperor	DK	284	Salgado	DK
281	Eternity	DK	930	Saludo	DK
932	Expert	DK	997	Schobbi CS	DK
994	Exxtens	DK	993	Sergio KWS	DK
976	Fieldstar	DK	977	Severus	DK
935	Formula	DK	1013	Sphinxx	DK
1043	Gatsby	DK	1001	Sunlite	DK
1006	Glory	DK	1014	SY Feeditop	DK
999	Grizzly	DK	1021	SY Milkytop	DK
1003	Hyperion	DK	1030	SY Nordicstar	DK
1038	Ikke i anvendelse	DK	1047	SY Scandik	DK
1000	Jensen	DK	180	Tassilo	DK
931	Jiffy	DK	228	Topper	DK
198	Justina	DK	265	Treasure	DK
998	Kainoas	DK	1005	Triton KWS	DK
243	Kalabas	DK	978	Truxx	DK
964	Kaspian	DK	965	Utopia	DK
244	Kaukas	DK	189	Vernal	DK
973	Keen	DK	267	Vogue	DK
952	Klaymore	DK	1048	Wizard	DK
955	Koloris	DK	991	Zarlixx	DK
1027	Kompetens	DK			

## Fodder beets

Id	Name	CountryID (NorFor = all countries)
183	Colosse	DK
205	Kyros	DK
924	Magnum	DK
100	Nestor	DK
223	Troya	DK

## 8.8 VarietyGroup

Names in English. Swedish. Danish. Norwegian, Icelandic, German, Italian and Romanian.

Id	Name	NorwegianName	SwedishName	DanishName	IcelandicName
1	Grass mixtures	Grasblanding	Gräsblandningar	Græsblandinger	Grasblanda
2	Italian ryegrass	Italiensk raigras	Italienskt rajgräs	Italiensk rajgræs	Italian rýgresi
3	Hybrid ryegrass	Hybrid raigras	Hybrid rajgräs	Hybrid rajgræs	Blandað rýgresi
4	Barley	Bygg	Korn	Byg	Bygg
5	Wheat	Hvete	Vete	Hvede	Hveiti
6	Rye	Rug	Råg	Rug	Rúgur
7	Triticale	Triticale	Rågvetete	Triticale	Triticale
8	Oat	Havre	Havre	Havre	Hafrar
9	Peas	Erter	Ärter	Markært	Ertur
10	Maize	Mais	Majs	Majs	Maís
11	Fodder beets	Fôrbeter	Foderbetor	Bederoer	Fóður rófur
12	Timothy	Timotei	Timotej	Timothe	Vallarfoxgras
13	Meadow fescue	Engsvingel	Ängssvingel	Engsvingel	Hávingull
14	Cocksfoot	Hundegräs	Hundäxing	Hundegræs	Axhnoðapuntur
15	Hungarian Brome	Bladfaks	Foderlost	Stakløs Hejre	Sandfax
16	Smooth-stalked meadow grass	Engrapp	Ängsgröe	Engrapgræs	Vallarsveifgras
17	Rough Meadow grass	Markrapp	Kärrgröe	Almindelig Rapgræs	Hasveifgras
18	Common Bent	Engkvein	Rödven	Almindelig Hvene	Hálingresi
19	Reed Canary-grass	Strandrør	Rörflen	Rørgræs	Strandreyr
20	Red fescue	Rødsvingel	Rødsvingel	Rødsvingel	Rauðvingull
22	Westerwolds ryegrass	Westerwoldsk raigras	Westerwoldskt rajgräs	Westervoldsk rajgræs	Westerwolds rýgresi
23	Meadow Foxtail	Engrevehale	Ängskavle	Eng-Rævehale	Haliðagras
24	Other grass species	Andre grasarter	Övriga grössorter	Andre græsarter	Aðrar gras tegundir
25	Red clover	Rødkløver	Rødklöver	Rødkløver	Rauðsmári
26	Alsike Clover	Alsikekløver	Alsikeklöver	Alsikekløver	Túnsmári
27	White clover	Hvitkløver	Vitklöver	Hvitkløver	Hvítsmári

28	Other leguminous plants	Andre belgvekster	Övriga baljväxter	Andre bælgplanter	Aðrar belgjurtir
29	Rape	Fôrraps	Foderraps	Foderraps	Fóðurrepja
30	Marrow-stem kale	Fôrmargkål	Fodermärgkål	Fodermarvkål	Fóðurmergkål
31	Other crucifers	Andre korsbl.	Övriga korsblommiga växter	Andre korsblomstrede	Other crucifers
32	Weeds	Ugras	Ogräs	Ukrudt	Illgresi
33	Perennial ryegrass	Flerårig raigras	Perenna rajgräs	Almindelig rajgræs	Fjölært rýgresi
34	Lucerne	Luserne	Lusern	Lucerne	Refasmári
35	Festulolium	Raisvingel	Rajsvingel	Rajsvingel	Rývingull

<b>Id</b>	<b>Name</b>	<b>GermanName</b>	<b>ItalianName</b>	<b>RomanianName</b>
	Grass mixtures	Gras Mischungen	Miscele di erba	Amestec de ierburi
	Italian ryegrass	Italienisches Weidelgrass	Loglio italiano	Raigras italian (Lolium multiflorum)
	Hybrid ryegrass	Hybrid Weidelgrass	Loglio ibrido	Raigras hibrid (Lolium hybridum)
	Barley	Gerste	Orzo	Orz (Hordeum vulgare)
	Wheat	Weizen	Grano	Grâu (Triticum aestivum)
	Rye	Roggen	Segale	Secară (Secale cereale)
	Triticale	Triticale	Triticale	Triticale (Triticosecale)
	Oat	Hafer	Avena	Ovăz (Avena sativa)
	Peas	Erbsen	Piselli	Mazăre (Pisum sativum)
	Maize	Mais	Mais	Porumb (Zea mays)
	Fodder beets	Futterrüben	Barbabietole	Sfeclă furajeră (Beta vulgaris)
	Timothy	Wiesenlieschgradd	Fleolo	Timoftică (Phleum pratense)
	Meadow fescue	Wiesenschwingel	Festuca dei prati	Păiuș de livadă (Festuca pratensis)
	Cocksfoot	Knaulgras	Dactylis glomerata	Golomăț (Dactylis glomerata)
	Hungarian Brome	Ungarische Trespe	Bromo ungherese	Obsigă nearistată (Bromus inermis)
	Smooth-stalked meadow grass	Wiesenrispengras	Poa pratensis	Firuță (Poa pratensis)
	Rough Meadow grass	Gemeines Rispengras	Poa trivialis	Firuță albastră (Poa trivialis)
	Common Bent	Rotes Straußgras	Agrostide Tenue	Iarba câmpului (Agrostis capillaris)
	Reed Canary-grass	Rohrglanzgras	Phalaris arundinacea	Iarbă-albă (Phalaris arundinacea)
	Red fescue	Rotschwingel	Festuca rossa	Păiuș roșu (Festuca rubra)
	Westerwolds ryegrass	Welsches Weidelgras	Lolium multiflorum	Raigras westerwoldicum (Lolium mul. westerwoldicum)
	Meadow Foxtail	Wiesenfuchsschwanz	coda di volpe	Coadă vulpii (Alopecurus pratensis)
	Other grass species	Andere Grasarten	Altre specie di erba	Alte graminee
	Red clover	Rotklee	Trifoglio rosso	Trifoi roșu (Trifolium pratense)
	Alsike Clover	Schwedenklee	Trifoglio ibrido	Trifoiu hibrid (Trifolium hybridum)
	White clover	Weißklee	Trifoglio bianco	Trifoi alb (Trifolium repens)



	Other leguminous plants	Andere Leguminosen	Altre leguminose	Alte leguminoase
	Rape	Raps	Colza	Rapiță (Brassica napus)
	Marrow-stem kale	Markstammkohl	Brassica oleracea var. medullosa	Varză furajeră (Brassica oleracea)
	Other crucifers	Andere Cruziferen	Altre crucifere	Alte crucifere
	Weeds	Gräser	Erbe varie	Buruieni
	Perennial ryegrass	Deutsches Weidelgras	loglio perenne	Raigras englezesc (Lolium perenne)
	Lucerne	Luzerne	Erba medica	Lucerna (Medicago sativa)
	Festulolium	Wiesenschweidel	Festulolium	Festulolium (Festulolium)

## 8.9 Contractors

### Names in English

ContractorID	Contractor Name	CountryID
1	1 Døllefjelde Maskinstation A/S	DK
2	2 Eskilstrup Maskinstation	DK
3	3 Thingstrup Maskinstation KS	DK
4	4 Ravnholtlund Maskinstation	DK
5	5 Skovvejens Maskinstation KS	DK
6	6 Ringberg Sørensen I/S	DK
7	7 Tipsmark Maskinstation	DK
8	8 Kærby Maskinstation	DK
9	9 Møborg Maskinstation I/S	DK
10	10 Morsø Maskinstation	DK
11	11 Hodsager Maskinstation	DK
12	12 Maskinstation v/ Erling Kjær	DK
13	13 Eriksens Maskinstation A/S	DK
14	14 Stadil Maskinstation	DK
15	15 Benno Gosvig's Maskinstation & Entr. Forretning	DK
16	16 Bork Maskinstation ApS	DK
17	17 Vejvad Maskinstation	DK
18	18 Langelund Maskinstation	DK
19	19 Mogens Nielsen Maskinstation	DK
20	20 Voerhøj Maskinstation A/S	DK
21	21 Hellum Maskinstation	DK
22	22 Canada Maskinstation	DK
23	23 Vester Åby APS	DK
24	24 Ørum Maskinstation A/S	DK
25	25 Varnæsløkke Maskinstation & Kloakservice	DK
26	26 Nymark Maskinstation	DK
27	27 Lerskov Maskinstation A/S	DK
28	28 Lerbjerg Maskinstation	DK
29	29 Green maskinstation	DK
30	30 Kammers Maskinstation	DK
31	31 Skjern Egnens Maskinstation ApS	DK
32	32 Voldsted Landbrug og Maskinstation	DK
33	33 Vraa Maskinstation	DK
34	34 Hjadstrup Maskinstation	DK
35	35 Kaj Pedersen Maskinstation	DK
36	36 Fuglsbæk	DK
37	37 Ørritslev Maskinstation	DK
38	38 Assenbølle Maskinstation A/S	DK
39	39 Kr. Stillinge Maskinstation ApS "Testgården"	DK
40	40 Mosegården ApS	DK
41	41 Lille Donnerup Maskinstation	DK
42	42 Torben Poulsen	DK
43	43 Lunde Entr. & Maskinstation	DK
44	44 Højen Maskinstation A/S	DK
45	45 Jaungyde Maskinstation A/S	DK
46	46 Jedsted Maskinstation A/S	DK
47	47 Varde Maskinstation a.m.b.a.	DK
48	48 Bøvlingbjerg Maskinstation	DK
49	49 Kratgårds Maskinstation	DK
50	50 Rønbjerg Maskinstation Aps	DK
51	51 Brørup Maskinstation Aps	DK
52	52 Ramme Maskinstation I/S	DK

53	53 Engegårds Maskinstation	DK
54	54 Sdr. Malle Maskinstation	DK
55	55 Lydum Maskinstation	DK
56	56 Tørring Maskinstation Aps	DK
57	57 Sdr. Farup Maskinstation	DK
58	58 Skamstrup Maskinstation Aps	DK
59	59 Skalmstrup Maskinstation	DK
60	60 Tolstrup Maskinstation	DK
61	61 Linde Maskinstation	DK
62	62 Anbæk Maskinstation A/S	DK
63	63 Jejsing Maskinstation	DK
64	64 Hvornum Maskinstation	DK
65	65 Sjørsløv Maskinstation I/S	DK
66	66 Terp Maskinstation Aps	DK
67	67 Vorning Maskinstation	DK
68	68 Skærvad Mskinstation	DK
69	69 Langå Maskinstation	DK
70	70 Mols Maskinstation	DK
71	71 Skablund-Fillerup Maskinstation	DK
72	72 Hyrup Maskinstation A/S	DK
73	73 Rask Mølle Maskinstation	DK
74	74 Hatting Maskinstation	DK
75	75 Lyneborg Maskinstation	DK
76	76 Nørrevang Maskinstation	DK
77	77 Risgårdens Maskinstation	DK
78	78 Ravning Maskinstation A/S	DK
79	79 Egebjerg Maskinstation	DK
80	80 Lundgårds Maskinstation	DK
81	81 Fredsø Maskinstation	DK
82	82 Kamps Maskinstation	DK
83	83 Skovbækgård	DK
84	84 Uhe Maskinstation	DK
85	85 Dørken Maskinstation A/S	DK
86	86 Lintrup Maskinstation	DK
87	87 Nordenbjerg Maskinstation	DK
88	88 Højen Maskinstation	DK
89	89 Naur Maskinstation I/S	DK
90	90 Kjærs Maskinstation	DK
91	91 Bramming Maskinstation	DK
92	92 Dollerup Maskinstation	DK
93	93 Frøstrup Maskinstation	DK
94	94 Næstild Maskinstation	DK
95	95 Elsted Maskinstation	DK
96	96 Sørup Maskinstation Aps	DK
97	97 Maskinstation Martin Børsting	DK
98	98 Vraa Mølle Maskinstation	DK
99	99 Midthys Maskinstation	DK
100	100 PC-Foder	DK
101	101 Hejnsvig Maskinstation A/S	DK
102	102 Sennels Entreprenør og Maskinstation	DK
103	103 Borup Maskinstation Aps	DK
104	104 Klovtoft Maskinstation	DK
105	105 Hjortvad Maskinstation A/S	DK
106	106 Lindholm Maskinstation	DK
107	107 Brdr. Jacobsens Maskinstation	DK

108	108 Edmund Holm	DK
109	109 Vesterbølle Maskinstation v. Jørn Kynæb	DK
110	110 Andreas' Maskinstation	DK
111	111 Kvosted Maskinstation	DK
112	112 Sjørup Maskinstation	DK
113	113 Preben Laursen	DK
114	114 Hald & Hansen Maskinstation	DK
115	115 HKH Service	DK
116	116 SME Staby Maskinstation og Entreprenørfirma ApS	DK
117	117 Stauning Maskinstation	DK
118	118 Bounum Maskinstation A/S	DK
119	119 Niels Peder Matthiesen	DK
120	120 Bredebro Maskinstation	DK
121	121 Errested Maskinstation	DK
122	122 Fæsted Maskinstation	DK
123	123 Gads Maskinstation	DK
124	124 Tiset Maskinstation	DK
125	125 Ole Roostgaard Andersen	DK
126	126 Sandallund Maskinstation	DK
127	127 Torben Jensen	DK
128	128 Rejsby Maskinstation	DK
129	129 Vejrup Maskinstation	DK
130	130 Kim Vind Maskinstation	DK
131	131 Vrøgum Maskinstation	DK
132	132 Eget arbejde	DK

## 8.10 Range

Names in English

<b>Id</b>	<b>Name</b>
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