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Grape pomace

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FAO Ration Tool for dairy cows

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Description Nutritional aspects **Nutritional tables** References

Tables of chemical composition and nutritional value

- Grape pomace, dehydrated
- Grape pomace, fresh
- Grape pomace, fresh
- Grape pomace, silage

Avg: average or predicted value; SD: standard deviation; Min: minimum value; Max: maximum value; Nb: number of values (samples) used

Grape pomace, dehydrated

All types included: with or without stems, with or without seeds, from wineries, distillation or juice production



Main analysis	Unit	Avg	SD	Min	Max	Nb
Dry matter	% as fed	91.8	2.5	85.9	97.8	430
Crude protein	% DM	13.7	1.0	11.1	16.3	395
Crude fibre	% DM	26.1	3.5	17.6	35.4	437
NDF	% DM	64.1	4.3	50.7	74.6	203
ADF	% DM	54.7	4.9	42.6	67.0	208
Lignin	% DM	33.4	5.6	19.9	46.2	276
Ether extract	% DM	6.1	1.1	3.6	9.1	161
Ash	% DM	7.8	2.3	2.4	13.8	292
Starch (polarimetry)	% DM	0.6				1
Total sugars	% DM	0.8	0.4	0.0	2.1	73
Gross energy	MJ/kg DM	19.1	1.6	17.6	21.7	6 *

Minerals	Unit	Avg	SD	Min	Max	Nb
Calcium	g/kg DM	9.0	3.1	4.1	17.9	105
Phosphorus	g/kg DM	2.6	0.5	1.4	4.0	107
Potassium	g/kg DM	12.0	3.7	7.2	21.7	69
Sodium	g/kg DM	0.2	0.1	0.0	0.4	30
Magnesium	g/kg DM	0.8	0.1	0.7	1.0	5
Manganese	mg/kg DM	13	6	5	18	4
Zinc	mg/kg DM	26	14	11	43	4
Copper	mg/kg DM	70	41	0	162	137
Iron	mg/kg DM	266	140	160	425	3

Amino acids	Unit	Avg	SD	Min	Max	Nb
Alanine	% protein	4.6		4.3	4.9	2
Arginine	% protein	3.2				1
Aspartic acid	% protein	5.9		4.7	7.0	2
Cystine	% protein	1.3				1
Glutamic acid	% protein	13.2		11.4	15.1	2
Glycine	% protein	5.5		5.4	5.5	2
Histidine	% protein	2.3		1.8	2.8	2
Isoleucine	% protein	3.9		3.9	4.0	2
Leucine	% protein	6.8		6.7	6.8	2
Lysine	% protein	4.6		3.9	5.4	2
Phenylalanine	% protein	4.0				1
Proline	% protein	4.7				1
Serine	% protein	3.4				1
Threonine	% protein	3.8		3.5	4.1	2
Tyrosine	% protein	2.4		2.0	2.8	2
Valine	% protein	3.6		2.4	4.7	2

Secondary metabolites	Unit	Avg	SD	Min	Max	Nb
Tannins (eq. tannic acid)	g/kg DM	135.7	92.5	15.4	343.0	15
Tannins, condensed (eq. catechin)	g/kg DM	92.1	53.0	20.4	138.1	4

Ruminant nutritive values	Unit	Avg	SD	Min	Max	Nb
OM digestibility, ruminants	%	30.1	5.4	22.5	37.2	7
Energy digestibility, ruminants	%	28.0				*
DE ruminants	MJ/kg DM	5.3				*
ME ruminants	MJ/kg DM	4.3				*
Nitrogen digestibility, ruminants	%	48.0	11.4	8.6	48.0	4 *
a (N)	%	10.0		4.4	15.7	2
b (N)	%	14.5		11.6	17.5	2
c (N)	h-1	0.041		0.025	0.057	2
Nitrogen degradability (effective, k=4%)	%	17				*
Nitrogen degradability (effective, k=6%)	%	16	9	9	32	6 *

Rabbit nutritive values	Unit	Avg	SD	Min	Max	Nb
Energy digestibility, rabbit	%	25.5				*
DE rabbit	MJ/kg DM	4.9		3.9	5.8	2
Nitrogen digestibility, rabbit	%	-3.3		-13.0	6.4	2
ME rabbit	MJ/kg DM	4.9				*

The asterisk * indicates that the average value was obtained by an equation.

References

AFZ, 2011; Alibes et al., 1990; Bahrami et al., 2010; Bruttini, 1923; Chapoutot et al., 1990; Fegeros et al., 1987; Fernandez Carmona et al., 1996; Fraga et al., 1991; Gofii et al., 2007; Guemour et al., 2010; Hadjipanayiotou et al., 1976; Kandyliis et al., 1986; Krishna, 1985; Maertens et al., 2001; Moate et al., 2014; Mollaei et al., 2015; Morgan et al., 1980; Parigi-Bini et al., 1980; Regadas Filho et al., 2011; Sarcicek et al., 2002; Tsiplakou et al., 2008; Winkler et al., 2015; Wolter et al., 1979; Zalikarenab et al., 2007

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Grape pomace, fresh

All types included: with or without stems, with or without seeds, from wineries, distillation or juice production



Main analysis	Unit	Avg	SD	Min	Max	Nb
Dry matter	% as fed	38.7	7.5	27.3	59.5	21
Crude protein	% DM	11.6	2.1	8.3	15.5	21
Crude fibre	% DM	25.1	4.6	15.8	32.5	19
NDF	% DM	50.7	13.1	30.6	74.2	9
ADF	% DM	42.8	12.5	25.7	59.4	8
Lignin	% DM	30.7	8.8	20.2	38.8	4
Ether extract	% DM	5.2	2.0	2.7	9.9	16
Ash	% DM	7.3	2.7	3.2	12.8	22
Total sugars	% DM	18.5	11.5	3.9	31.8	7
Gross energy	MJ/kg DM	18.8	1.5	17.6	20.8	4 *

Minerals	Unit	Avg	SD	Min	Max	Nb
Calcium	g/kg DM	9.0	3.9	4.7	16.3	6
Phosphorus	g/kg DM	2.7	0.5	2.0	3.3	6
Copper	mg/kg DM	78				1

Secondary metabolites	Unit	Avg	SD	Min	Max	Nb
Tannins (eq. tannic acid)	g/kg DM	35.4	8.4	28.0	45.0	4
Tannins, condensed (eq. catechin)	g/kg DM	74.9	76.7	21.0	202.6	5

Ruminant nutritive values	Unit	Avg	SD	Min	Max	Nb
OM digestibility, ruminants	%	32.5	9.2	14.0	56.0	12
Energy digestibility, ruminants	%	29.9		29.9	48.7	2 *
DE ruminants	MJ/kg DM	5.6		5.6	9.1	2 *
ME ruminants	MJ/kg DM	4.6				*
Nitrogen digestibility, ruminants	%	15.2	9.3	5.5	30.0	6
a (N)	%	22.5	15.7	4.4	33.0	3
b (N)	%	22.4	12.9	14.0	37.2	3
c (N)	h-1	0.034	0.013	0.020	0.045	3
Nitrogen degradability (effective, k=4%)	%	33	13	17	40	3 *
Nitrogen degradability (effective, k=6%)	%	31	14	14	39	3 *

The asterisk * indicates that the average value was obtained by an equation.

References

Abarghuei et al., 2015; AFZ, 2011; Alibes et al., 1990; Basalan et al., 2011; Baumgärtel et al., 2007; Maymone et al., 1945; Molina-Alcaide et al., 2008; Oluyemi et al., 1982; Tisserand et al., 1989; Vargas et al., 1965; Winkler et al., 2015

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Grape pomace, fresh

All types included: with or without stems, with or without seeds, from wineries, distillation or juice production



Main analysis	Unit	Avg	SD	Min	Max	Nb
Dry matter	% as fed	38.7	7.5	27.3	59.5	21
Crude protein	% DM	11.6	2.1	8.3	15.5	21
Crude fibre	% DM	25.1	4.6	15.8	32.5	19
NDF	% DM	50.7	13.1	30.6	74.2	9
ADF	% DM	42.8	12.5	25.7	59.4	8
Lignin	% DM	30.7	8.8	20.2	38.8	4
Ether extract	% DM	5.2	2.0	2.7	9.9	16
Ash	% DM	7.3	2.7	3.2	12.8	22
Total sugars	% DM	18.5	11.5	3.9	31.8	7
Gross energy	MJ/kg DM	18.8	1.5	17.6	20.8	4 *

Minerals	Unit	Avg	SD	Min	Max	Nb
Calcium	g/kg DM	9.0	3.9	4.7	16.3	6
Phosphorus	g/kg DM	2.7	0.5	2.0	3.3	6
Copper	mg/kg DM	78				1

Secondary metabolites	Unit	Avg	SD	Min	Max	Nb
Tannins (eq. tannic acid)	g/kg DM	35.4	8.4	28.0	45.0	4
Tannins, condensed (eq. catechin)	g/kg DM	74.9	76.7	21.0	202.6	5

Ruminant nutritive values	Unit	Avg	SD	Min	Max	Nb
OM digestibility, ruminants	%	32.5	9.2	14.0	56.0	12
Energy digestibility, ruminants	%	29.9		29.9	48.7	2 *
DE ruminants	MJ/kg DM	5.6		5.6	9.1	2 *
ME ruminants	MJ/kg DM	4.6				*
Nitrogen digestibility, ruminants	%	15.2	9.3	5.5	30.0	6
a (N)	%	22.5	15.7	4.4	33.0	3
b (N)	%	22.4	12.9	14.0	37.2	3
c (N)	h-1	0.034	0.013	0.020	0.045	3
Nitrogen degradability (effective, k=4%)	%	33	13	17	40	3 *
Nitrogen degradability (effective, k=6%)	%	31	14	14	39	3 *

The asterisk * indicates that the average value was obtained by an equation.

References

Abarghuei et al., 2015; AFZ, 2011; Alibes et al., 1990; Basalan et al., 2011; Baumgärtel et al., 2007; Maymone et al., 1945; Molina-Alcaide et al., 2008; Oluyemi et al., 1982; Tisserand et al., 1989; Vargas et al., 1965; Winkler et al., 2015

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Grape pomace, silage

All types included: with or without stems, with or without seeds, from wineries, distillation or juice production



Main analysis	Unit	Avg	SD	Min	Max	Nb
Dry matter	% as fed	37.0	7.6	29.5	47.1	5
Crude protein	% DM	12.9	1.1	10.9	14.2	7
Crude fibre	% DM	27.7	2.6	24.2	29.9	6
NDF	% DM	54.2	14.4	40.1	68.9	3
ADF	% DM	53.3	8.7	44.8	62.1	3
Lignin	% DM	36.2		30.1	42.2	2
Ether extract	% DM	6.8	4.3	2.0	12.6	5
Ash	% DM	7.1	1.3	5.6	8.8	6
Starch (polarimetry)	% DM	0.3				1
Gross energy	MJ/kg DM	19.4				*

Minerals	Unit	Avg	SD	Min	Max	Nb
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Calcium	g/kg DM	6.1				1
Potassium	g/kg DM	19.4				1
Sodium	g/kg DM	0.2				1
Magnesium	g/kg DM	1.2				1
Copper	mg/kg DM	34				1
Secondary metabolites						
	Unit	Avg	SD	Min	Max	Nb
Tannins (eq. tannic acid)	g/kg DM	36.0				1
Tannins, condensed (eq. catechin)	g/kg DM	8.1				1
Ruminant nutritive values						
	Unit	Avg	SD	Min	Max	Nb
OM digestibility, ruminants	%	25.5	7.0	14.0	32.5	5
Energy digestibility, ruminants	%	23.4				*
DE ruminants	MJ/kg DM	4.5				*
ME ruminants	MJ/kg DM	3.7				*
Nitrogen digestibility, ruminants	%	42.1	7.4	2.0	42.1	4 *

The asterisk * indicates that the average value was obtained by an equation.

References

Alibes et al., 1990; Larwence et al., 1983; Moate et al., 2014; Reyne et al., 1977; Winkler et al., 2015

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