

biomasa ENERGIJA SVUDA OKO NAS



KATALOG PROIZVODA OD POLJOPRIVREDNE BIOMASE

AGRICULTURAL BIOMASS PRODUCT CATALOGUE





Srpski



English

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KATALOG PROIZVODA OD POLJOPRIVREDNE BIOMASE



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1 UVOD

Osnovni cilj izrade Kataloga proizvoda od poljoprivredne biomase predstavlja pružanje jasnih i nedvosmislenih principa klasifikacije proizvoda, specifikacija njihovih dimenzija, jedinica mere u kojima se proizvode i distribuiraju na tržište i ostalih elemenata od značaja za efikasnu trgovinu i dobro razumevanje između prodavca i kupca. Pored navedenog, Katalog proizvoda od poljoprivredne biomase (u nastavku Katalog) je dobar alat za izveštavanje od strane proizvođača i trgovaca prema nadležnim telima, komorama, asocijacijama i drugim organizacijama.

Glavna **svrha izrade** Kataloga predstavlja podršku:

- uspostavljanja tržišta poljoprivredne biomase kao sirovine za proizvodnju energije,
- programerima i drugim učesnicima u procesu formiranja baze podataka za potrebe trgovine ovim proizvodima na **berzi biomase** i
- **direktnim učesnicima u procesu trgovine za bolje razumevanje karakteristika proizvoda sa kojima trguju.**

Iz tog razloga svakom proizvodu od biomase dodeljen je odgovarajući generički kod, a unutar njega definisan je trgovački kod sa najvažnijim elementima koji omogućavaju jasno prepoznavanje proizvoda i njegovih karakteristika (pre svega: klase kvaliteta, nivoa vlažnosti, dimenzija i jedinice mere).

Definisanje trgovačkog koda bazirano je na EN14961-1 standarda pri čemu su korišćeni parametri i vrednosti iz literature i prakse.

U cilju efikasnije trgovine na berzi biomase kao i sprečavanja nesporazuma između učesnika u trgovini preporuka je da se isti dobro upoznaju sa svim elementima iz ovog Kataloga.

2 OSNOVNA PODELA

Osnovna podela u ovom Katalogu jeste na poljoprivrednu biomasu biljnog i životinjskog porekla - stajnjak.

2.1 Poljoprivredna biomasa biljnog porekla

Osnovna podela za kategorizaciju je urađena na osnovu standarda EN14961-1 (Čvrsta biogoriva - Specifikacije goriva i klase – Deo 1: Opšti uslovi¹), pri čemu, u odnosu na standard EN 14961-1, nisu obuhvaćeni biomasa iz proizvodnje povrća i cveća zbog ograničenih količina i samim tim manjeg potencijala za proizvodnju energije u Srbiji.

Takođe, blendovi i mešavine nisu posebno obrađeni već su ostavljeni korisnicima da kombinuju trgovačke kodove u zavisnosti od mešavine².

U tabeli ispod je prikazana podela na kategorije i potkategorije sa vrstama koje su obuhvaćene, pri čemu su potkategorije pripremljene uzimajući u obzir način uzgajanja i karakteristike u Srbiji koje utiču na korišćenje biomase za proizvodnju energije. Takođe, Tabela 1 Kategorije poljoprivredne biomase biljnog porekla koja je prikazana ispod obuhvata i pregled delova biljke koje se koriste za proizvodnju energije za svaku potkategoriju.

Tabela 1: Kategorije poljoprivredne biomase biljnog porekla

POTKATEGORIJA	OPIS (VRSTE KOJE SU OBUHVAĆENE)	DELOVI BILJKE KOJE SE NAJČEŠĆE KORISTE
C - Žitarice		
C1	Pšenica, ovas, ječam, raž, pirinač	Cela biljka Delovi biljke Zrnasti otpad
C2	Kukuruz	Cela biljka Oklasak Deo biljke Zrnasti otpad
C3	Proso, sirak	Cela biljka Deo biljke Zrnasti otpad
G - Trave i drvenaste biljke (energetski zasadi)		
G1	Trave – Switchgrass, slatki sirak	- Cela biljka
G2	Trska - Miscanthus	- Cela biljka
G3	Drvenasto	- Cela biljka

¹ Solid biofuels - Fuel specifications and classes – Part 1: General requirements

² Blendovi predstavljaju planski pripremljenu mešavinu više vrsta biomase (uz to može i više granulacija) u zadatoj srazmeri, dok se pod mešavinom biomase podrazumeva organski materijal koji je neplanski pomešan (npr. ostaci nakon komunalnih radova, tzv. komunalni otpad i dr.).

O - Uljarice		
O1	Soja	Cela biljka Stabljika i lišće Ljuske i zrnasti otpad
O2	Uljana repica, lan, ricinus	Cela biljka Stabljika i lišće Ljuske i zrnasti otpad
O3	Suncokret	Cela biljka Stabljika i lišće Ljuske i zrnasti otpad
R – Povrće i korenaste kulture		
R1	Šećerna repa i ostaci povrća	Ostaci biljaka
L – Leguminozne biljke		
L1	Pasulj, bob, grašak, kikiriki, sočivo, naut (leblebija)	Cela biljka Stablo i lišće
H – Ostaci zeljastih biljaka iz vrtova, parkova i održavanja puteva, voćnjaka i vinograda		
H1	Trava	Cela biljka
H2	Drvena biomasa	Cela biljka

2.2 Poljoprivredna biomasa životinjskog porekla - stajnjak

Za potrebe ovog Kataloga obrađena je podela najvažnije biomase životinjskog porekla – stajnjak. Osnovni parametri za podelu stajnjaka su sledeći:

- poreklo: muzne krave, tovnja junad, svinje, perad, konji, koze i ovce,
- da li je prošao separaciju ili ne,
- da li je pomešan sa prostirkom ili ne.

Poseban parametar kojim se opisuje primerenost korišćenja stajnjaka jeste udeo čvrste materije u stajnjaku koji najviše zavisi od prethodna tri parametra.

Sadržaj suve materije u tečnom stajnjaku je različit kod različitih vrsta i kategorija gajenih životinja, a zavisi uglavnom od vrste, načina uzgoja i ishrane i godišnjeg doba. U postupcima manipulacije tečnim stajnjakom, pri pranju objekata - neracionalnom prekomernom rasipanju vode ili izloženošću priliva atmosferskih ili drugih voda - može doći do znatnog razređivanja tečnog stajnjaka, a time i do znatnog narušavanja odnosa.

3 OPIS POJEDINIH PARAMETARA TRGOVAČKIH KODOVA

3.1 Parametri za definisanje trgovačkog koda za poljoprivrednu biljnu biomasu

Šifra kodiranja:

Tip proizvoda_Potkategorija_Deo biljke_Forma biomase_Gustina_Vlažnost

Kod obuhvata četiri parametra koja su definisana poreklom biomase i načinom pripreme (tip proizvoda, potkategorija, deo biljke i forma), dok su gustina i vlažnost parametri koji su merljivi. Jedinica mere koja je uzeta za sve vrste proizvoda jeste kilogram (kg).

Definisani su parametri koji su proverljivi i kao takvi olakšavaju trgovinu i smanjuju mogućnost nesporazuma između učesnika u tom procesu.

U nastavku su date najznačajnije karakteristike pojedinih parametara.

3.1.1 Tip proizvoda i potkategorija

Kao što je prikazano u prethodnom poglavlju, podela na tipove proizvoda je urađena na osnovu standarda EN14961-1, pri čemu, u odnosu na standard EN 14961-1, nisu obuhvaćeni biomasa iz proizvodnje povrća i cveća zbog male primene za proizvodnju energije u Srbiji.

Definisani su sledeći tipovi proizvoda:

- **žitarice,**
- **trave i drvenasti zasadi (energetski zasadi),**
- **uljarice,**
- **leguminoze,**
- **povrće i korenasti usevi,**
- **ostaci zeljastih biljaka iz vrtova, parkova i održavanja puteva, voćnjaka i vinograda.**

Potkategorije obuhvataju grupu biljnih vrsta koje su definisane uzimajući u obzir način uzgajanja i karakteristike koje utiču na korišćene biomase za proizvodnju energije. Podela na tipove proizvoda i potkategorije je prikazana u Tabeli 2 ispod:

Tabela 2: Potkategorije za poljoprivrednu biomasu biljnog porekla

TIP PROIZVODA	POTKATEGORIJA
Žitarice	C 1: Pšenica, ovas, ječam, pirinač, raž C2: Kukuruz C3: Proso, sirak
Trave i drvenasti zasadi (energetski zasadi)	G1: Trave – Switchgrass, slatki sirak G2: Trska – Miscanthus G3: Drvenaste kulture
Uljarice	O1; Soja

	O2: Uljana repica, lan, ricinus O3: Suncokret
Leguminoze	L1: Pasulj, bob, grašak, kikiriki, sočivo, naut (leblebija)
Povrće i korenasti usevi	R1: Šećerna repa i ostaci povrća
Ostaci zeljastih biljaka iz vrtova, parkova i održavanja puteva, voćnjaka i vinograda	H1: Trave H2: Drvena biomasa

3.1.2 Forma biomase

U Katalogu su obrađeni sledeći načini pripreme biomase:

- Pelete

Pelet je cilindričnog oblika, uobičajenog prečnika Ø 6 do 12 mm, sa dužinom 4 do 5 puta od prečnika. Površina peleta je ravna, stabilna, čvrsta i najčešće bez prašine. Gustina peleta može da bude preko 650 kg/m³. Dostupan je u rinfuzi, vrećama i velikim džambo vrećama. Manipulacija se vrši ručno ili mehanizovano.

- Briketi

Briketi mogu biti cilindričnog oblika, uobičajenog prečnika Ø 80 do 90 mm, a mogu biti i u obliku kvadra različitih dimenzija, najčešće 150*70*60 mm. Površina briketa je najčešće neravna i delimično se osipa. Gustina briketa se kreće do 600 kg/m³ (u izuzetnim prilikama i više). Dostupan je u vrećama, velikim džambo vrećama i kontejnerima. Manipulacija se vrši ručno ili mehanizovano.

- Kvadar – male bale

Male kvadar bale se formiraju pod višim pritiscima. Najčešće su širine do 0,5 m, visine do 0,4 m, a dužina im je oko 1 m. Gustine su do 130 kg/m³. Masa bala se kreće do 25 kg, tako da svojim dimenzijama i masom omogućavaju da se sve tehnološke operacije u njihovom pripremanju i manipulaciji obavljaju ručno.

- Kvadar – velike bale

Velike kvadar bale se formiraju pod visokim pritiskom. Najčešće su širine do 0,8 - 1,2 m, visine do 0,5 - 1,3 m, a dužina im je do 2,8 m. Gustine su do 160 kg/m³. Masa bala se kreće do 550 kg. Tehnološke operacije u njihovom pripremanju i manipulaciji obavljaju se uz pomoć mehanizacije. Danas se kod većih potrošača balirane biomase ovakva forma biomase najčešće koristi.

- Kvadar – velike bale usitnjena biomasa

Velike kvadar bale sa prethodno usitnjenom biomasom se formiraju pod najvišim pritiscima. Najčešće su im dimenzije indentične kao i za neusitnjenu biomasu, tako da su širine do 0,8 - 1,2 m, visine do 0,5 - 1,3 m, a dužina im je do 3 m. Gustine su i preko 170 kg/m³. Masa bala se kreće do 650 kg. Tehnološke operacije u njihovom pripremanju i manipulaciji obavljaju se uz pomoć mehanizacije.

- Rol – male bale

Male rol bale se formiraju pod visokim pritiskom. Najčešće su širine 1,2 - 1,5 m, prečnika do 0,9 m. Gustine su do 120 kg/m³. Masa bala se kreće do 115 kg. Tehnološke operacije u njihovom pripremanju i manipulaciji obavljaju se uz pomoć lakše mehanizacije.

- **Rol – velike bale**

Velike rol bale se formiraju pod visokim pritiskom. Najčešće su širine 1,2 -1,5 m, prečnika do 1,8 m. Gustine su do 120 kg/m³. Masa bala se kreće do 400 kg. Tehnološke operacije u njihovom pripremanju i manipulaciji obavljaju se uz pomoć mehanizacije.

- **Biomasa u rasutom stanju (rinfuz)**

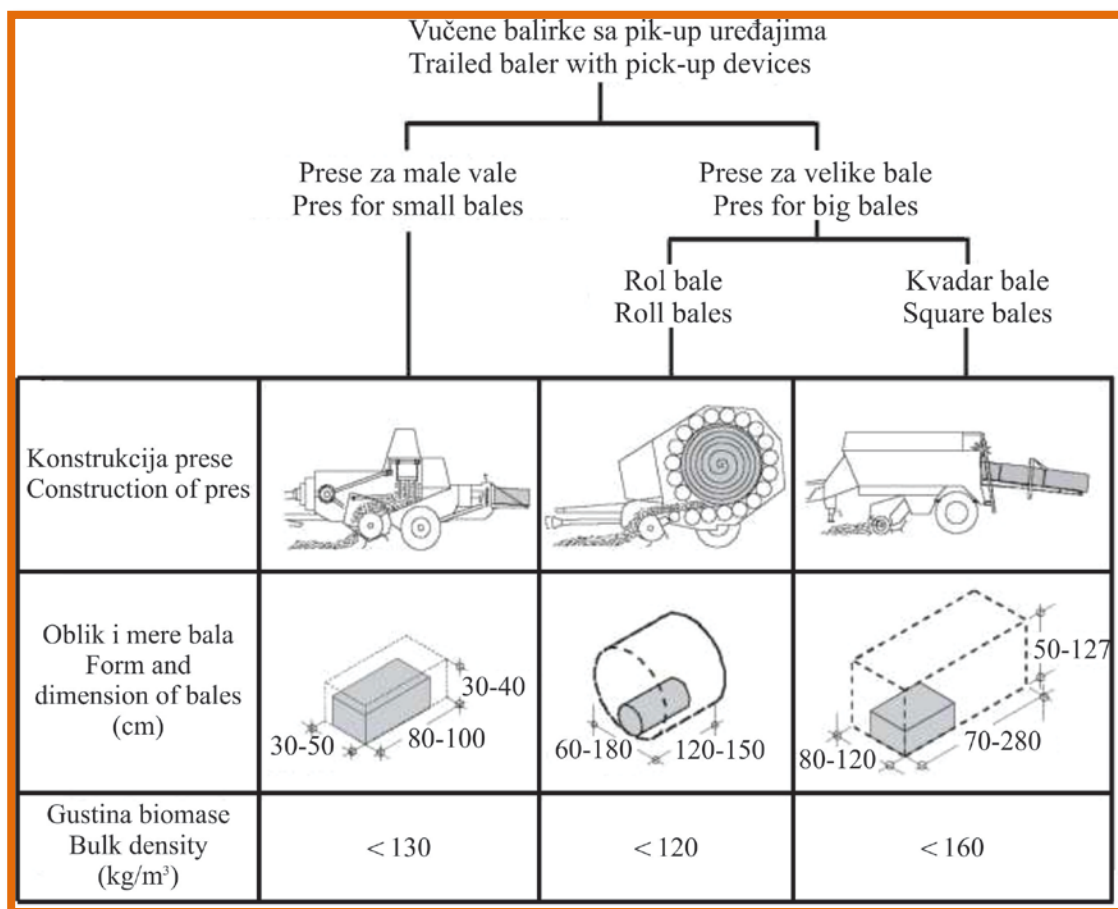
Gustina rasute biomase se kreće ispod 80 kg/m³ (izuzev zrnastog otpada), tj. najčešće do 50 kg/m³ zbog čega uopšte nije pogodna za manipulaciju i transport na relativno veća rastojanja. U praksi se može naći u proizvodnim pogonima ili složena u stogove. Za dodatno usitnjavanje pri korišćenju se troši dodatni rad i energija, pa se to mora odraziti na cenu takve biomase.

- **Biomasa u rasutom stanju (rinfuz) usitnjena**

Gustina usitnjene rasute biomase se kreće do 100 kg/m³ (izuzev zrnastog otpada), tj. najčešće do 60 kg/m³ zbog čega uopšte nije pogodna za manipulaciju i transport na relativno veća rastojanja. U praksi se može naći u proizvodnim pogonima ili složena u stogove. U internom transportu i transportu na kratka rastojanja je pogodna.

DIMENZIJE BALA SLAME

Očekivane dimenzije biomase za sagorevanje u obliku bala su prikazane na sledećem šematskom prikazu (Hartmann, H.; Ernte. In; Kaltschmitt, M.; Hartmann, H.; Hofbauer, H. (Hrsg.) 2009. Energie aus Biomasse – Grundlagen, Techniken und Verfahren. 2. Aufl. Heidelberg: Springer, S. 217–244):



Sl. 1. Oblik i dimenzije bala biomase (Hartmann, 2009)

3.1.3 Gustina biomase biljnog porekla

Kao što je dato u opisima formi biomase, gustina zavisi od načina tehničke podešenosti opreme koja je korišćena u pripremi. U tabeli sa trgovačkim kodovima date su granične vrednosti gustine biomase uzimajući u obzir vrstu biomase i tehničke mogućnosti opreme za pripremu (formu) i kreće se u rasponu od 50 kg/m³ (biomasa u rasutom stanju) do preko 600 kg/m³ za pelete.

3.1.4 Vlažnost biomase biljnog porekla

Vlažnost biomase zavisi od biljne vrste, momenta žetve, atmosferskih uslova i načina rukovanja (skladištenje nakon žetve i način pripreme). U tabeli sa trgovačkim kodovima su date vrednosti vlažnosti biomase uzimajući u obzir biljnu vrstu, očekivano vreme žetve, način pripreme, očekivanog načina i mogućnosti korišćenja u energetske svrhe. Prikazana vlažnost se kreće u rasponu od ispod 15%, što je često kod biomase nastale kod žitarica i uljarica, do 80% u slučaju biomase u rasutom stanju od povrća i korenastih useva.

3.2 Trgovački kod za stajnjak

Kao što je navedeno u prethodnom poglavlju, osnovni parametri za podelu stajnjaka su sledeći:

- poreklo: muzne krave, tovnja junad, svinje, perad, konji, koze i ovce,
- da li je pomešan sa prostirkom ili ne,

- da li je prošao separaciju ili ne,
- udeo čvrste materije u stajnjaku %.

Za pripremu trgovačkih kodova korišćena je sledeća šifra kodiranja:

Vrsta biomase i vrsta stoke_Dodaci_Separacija_Udeo čvrste materije

3.3 Pregled skraćenica za pojedine parametre od značaja za definisanje trgovačkog koda

Za potrebe formiranja trgovačkog koda za proizvode u okviru ovog Kataloga korišćene su sledeće skraćenice (bazirano na prethodno opisanim elementima):

I. Skraćenice za tip proizvoda

TIP PROIZVODA	SKRAĆENICA
Žitarice	C
Trave i drvenaste biljke (energetski zasadi)	G
Uljarice	O
Povrće i korenaste kulture	R
Leguminozne biljke	L
Ostaci zeljastih biljaka iz vrtova, parkova i održavanja puteva, voćnjaka i vinograda	H
Stajnjak	S

II. Skraćenice za potkategorije

POTKATEGORIJA	SKRAĆENICA
Pšenica, ovas, ječam, pirinač, raž	C1
Kukuruz	C2
Proso, sirak	C3
Trave – Switchgrass, slatki sirak	G1
Trska - Miscanthus	G2
Drvenaste kulture	G3

Soja	O1
Uljana repica, lan, ricinus	O2
Suncokret	O3
Šećerna repa i ostaci povrća	R1
Pasulj, bob, grašak, kikiriki, sočivo, naut (leblebija)	L1
Trave	H1
Drvena biomasa	H2
Stajnjak od uzgoja muznih krava	SD
Stajnjak od uzgoja tovne junadi	SB
Stajnjak od uzgoja svinja	SS
Stajnjak od uzgoja pernate živine	SP
Stajnjak od uzgoja konja	SH
Stajnjak od uzgoja koza i ovaca	SG

III. Skraćenica za deo biljke

DEO BILJKE	SKRAĆENICA
Cela biljka	WP
Delovi biljke (bez zrna)	SP
Stablo i lišće	SL
Zrnasti otpad	GR
Oklasak	OK

IV. Skraćenice koje se odnose na formu biomase

NAZIV FORME	SKRAĆENICA
Pelete	PE
Briketi	BR
Kvadar – male bale	KM
Kvadar – velike bale	KV
Kvadar – velike bale usitnjena biomasa	KU
Rol – male bale	RM
Rol – velike bale	RV
Biomasa u rasutom stanju (rinfuz)	RA
Biomasa u rasutom stanju (rinfuz) usitnjena	RU

V. Skraćenice koje se odnose prisustvo prostirke u stajnjaku

SA PROSTIRKOM	SP
Bez prostirke	BP

VI. Skraćenice koje se odnose na separaciju stajnjaka

SA SEPARACIJOM	SS
Bez separacije	BS

3.4 Primeri formiranja trgovačkog koda

Na osnovu prethodno iznetih elemenata u nastavku su data dva primera formiranja trgovačkog koda za dva slučajno odabrana proizvoda na bazi poljoprivredne biomase, jedan biljnog i jedan životinjskog porekla.

Primer 1. Poljoprivredni proizvođač želi da ponudi na berzu biomase 10 t pšenične slame u formi velikih rol bala. Dimenzije bala slame su: širina 1,2 m i prečnik 1,5 m. Prosečna masa bala iznosi 250 kg. Izmerena vlažnost slame

iznosi 20%. Definirati trgovački kod kojim bi poljoprivredni proizvođač na vrlo jednostavan i razumljiv način ponudio berzi biomase proizvod navedenih parametara.

Trgovački kod za navedeni primer obuhvata:

Prva oznaka u kodu: tip proizvoda / vrsta biomase ..žitarice, pšenična slama (**C1**)
 Druga oznaka u kodu: deo biljke stabljika sa lišćem (**SP**)
 Treća oznaka u kodu: forma biomase velika rol bala (**RV**)
 Četvrta oznaka u kodu: gustina biomase (**DO2**) (gustina bala je $\geq 100 \text{ kg/m}^3$)
 Peta oznaka u kodu: vlažnost biomase (**M15**) (vlažnost biomase je $\leq 25\%$)

Trgovački kod za primer 1 bi glasio: **C1_SP_RV_DO2_M15**

Primer 2. Na farmi muznih krava sa uzgojem bez prostirke prodaje se tečni neseeparisani stajnjak. Udeo čvrste materije u stajnjaku iznosi 15%. Definirati trgovački kod kojim bi proizvođač na vrlo jednostavan i razumljiv način ponudio berzi biomase proizvod navedenih parametara.

Trgovački kod za navedeni primer obuhvata:

Prva oznaka u kodu: vrsta biomase / vrsta stoke stajnjak sa farme, krave muzare (**SD**)
 Druga oznaka u kodu: dodaci stajnjaku bez prostirke (**BP**)
 Treća oznaka u kodu: da li je izvršena separacija bez separacije (**BS**)
 Četvrta oznaka u kodu: udeo čvrste materije (**M15**)

Trgovački kod za primer 2 bi glasio: **SD_BP_BS_M15**

3.5 Okvirne vrednosti toplotne moći poljoprivredne biomase

3.5.1 Biomasa biljnog porekla

S obzirom da toplotna moć zavisi od mnoštva faktora, u tabeli 3 ispod su date samo okvirne vrednosti za pojedine delove biljke za određene kulture pri vlažnosti od 14% na osnovu dostupne literature (navedene u referencama):

Tabela 3: Okvirne vrednosti toplotne moći za određene kulture pri vlažnosti od 14%

KULTURA	DEO BILJKE	OKVIRNA TOPLOTNA MOĆ
Pšenica	Slama	14,00 MJ/kg
Ovas	Slama	14,50 MJ/kg
Ječam	Slama	14,20 MJ/kg
Raž	Slama	14,00 MJ/kg
Pirinač	Slama	13,40 MJ/kg
Kukuruz	Celo stablo	13,50 MJ/kg
Kukuruz	Oklasak	14,70 MJ/kg

Proso i sirak	Slama	13,20 MJ/kg
Switchgrass, slatki sirak	Cela biljka	13,90 MJ/kg
Trska - Miscanthus	Cela biljka	14,90 MJ/kg
Drvenasti energetske usevi	Cela biljka	15,90 MJ/kg
Soja	Slama	15,70 MJ/kg
Uljana repica, lan, ricinus	Slama	17,40 MJ/kg
Suncokret	Stablo	14,50 MJ/kg
Suncokret	Ljuske	17,55 MJ/kg
Pasulj, bob, grašak, kikiriki, sočivo, naut (leblebija)	Stablo	14,40 MJ/kg
Ostaci biljaka iz vrtova, parkova, održavanja puteva, voćnjaka i vinograda	Trave	13,20 MJ/kg
Ostaci biljaka iz vrtova, parkova, održavanja puteva, voćnjaka i vinograda	Drvena biomasa	15,50 MJ/kg

Pošto toplotne moći pojedinih vrsta biomase zavise najviše od njihovog hemijskog sastava, postoje obrasci da se matematički izračunaju.

Gornja toplotna moć goriva (h_s)

Loo i Koppejan (2008) daju empirijsku formulu za izračunavanje gornje toplotne moći biomase biljnog porekla sa prihvatljivom tačnošću (Loo, V. S., Koppejan, J.: Biomass combustion and co-firing, Earthscan, London, 2008, s. 442):

$$h_s = 0,3491 \cdot X_C + 1,1783 \cdot X_H + 0,1005 \cdot X_S - 0,0151 \cdot X_N - 0,1034 \cdot X_O - 0,0211 \cdot X_A \left[\frac{\text{MJ}}{\text{kg}} \right] \quad (1)$$

gde su:

X_C – procentualni udeo ugljenika u biomasi (suva baza),

X_H – procentualni udeo vodonika u biomasi (suva baza),

X_S – procentualni udeo sumpora u biomasi (suva baza),

X_N – procentualni udeo azota u biomasi (suva baza),

X_O – procentualni udeo kiseonika u biomasi (suva baza) i

X_A – procentualni udeo pepela u biomasi (suva baza).

Donja toplotna moć goriva (h_d) označava količinu toplote koja se oslobađa prilikom potpunog sagorevanja, kada se voda koja pri tom nastaje odvodi u vidu pare. Ova fizička veličina služi za određivanje stvarne količine toplote koja se oslobodi po jednom kilogramu goriva. Za donju toplotnu moć biomase (Callé, 2007) daje takođe empirijsku formulu, koja je zasnovana na poznavanju gornje toplotne moći (Callé, F. R.: The Biomass Assessment Handbook: Bioenergy for a Sustainable Environment, Earthscan, London, 2007, s. 269):

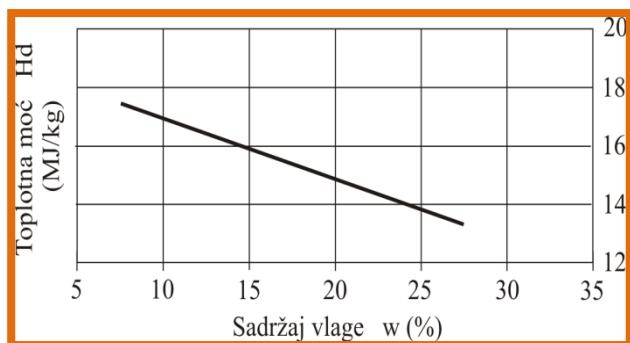
$$h_d = h_s \cdot \left(1 - \frac{W}{100}\right) - 2,447 \cdot \left(\frac{W}{100}\right) - 2,447 \cdot \left(\frac{H}{100}\right) \cdot 9,01 \cdot \left(1 - \frac{W}{100}\right) \quad (2)$$

gde su:

W - procentualni sadržaj vlage u biomasi i

H – procentualni sadržaj vodonika u biomasi (suva baza)

Toplotna moć se značajno menja sa promenom vlažnosti goriva, što se može videti na primeru oklaska:



3.5.2 Stajnjak

Radi orijentacije, tabela 4 ispod pokazuje očekivani sadržaj čvrste materije (%) u neseparisanom stajnjaku bez prostirke za stajnjak u zavisnosti od porekla (Kovčin S. (1993) Analiza stanja u oblasti proizvodnje i korišćenja stajnjaka, monografija: "Proizvodnja i korišćenje biogasa iz stajnjaka", Poljoprivredni fakultet, Novi Sad, 5-11.):

Tabela 4: Očekivani sadržaj čvrste materije u neseparisanom stajnjaku bez prostirke u zavisnosti od porekla (Kovčin, 1993.)

VRSTA STOKE	OČEKIVANI SADRŽAJ ČVRSTE MATERIJE (%) U NESEPARISANOM STAJNJAKU BEZ PROSTIRKE
Muzne krave	13
Tovna junad	11,5
Svinje	10
Perad	25

3.6 PREGLED LABORATORIJA ZA ISPITIVANJE KARAKTERISTIKA BIOMASE

U ovom poglavlju je dat prikaz laboratorija koje se bave ispitivanjem karakteristika biomase kao goriva.

INSTITUT ZA HEMIJU, TEHNOLOGIJU I METALURGIJU

Laboratorija centra za hemiju

Njegoševa 12, 11000 Beograd

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e-mail: ihtm@ihtm.bg.ac.rs

RUDARSKI INSTITUT D.O.O., Beograd

Laboratorija za čvrsta goriva

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tel: + 381 11 26 14 323

e-mail: hemija@ribeograd.ac.rs

JUGOINSPEKT BEOGRAD A.D.

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e-mail: office@jugoinspekt.com

INSTITUT ZA RATARSTVO I POVRTARSTVO

Laboratorija za zemljište i agroekologiju

Maksima Gorkog 30, 21000 Novi Sad

tel: +381 21 4898 100 -centrala, faks: +381 21 6621 212

e-mail: institut@ifvcns.ns.ac.rs

INSTITUT ZA NUKLEARNE NAUKE „VINČA“

Laboratorija za termotehniku i energetiku

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e-mail: office@vin.bg.ac.rs

MAŠINSKI FAKULTET U BEOGRADU

Laboratorija za goriva i sagorevanje

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tel: +381 11 3302-200, faks: +381 11 3370364

mf@mas.bg.ac.rs

INSTITUT ZA OPŠTU I FIZIČKU HEMIJU

Laboratorija za ispitivanje, istraživanje i razvoj

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tel: +381 11 186-742, 637-569, faks: +381 11 180-329

e-mail: bsimonovic@iofh.bg.ac.yu

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Hemijska laboratorija

Predstavništvo u Beogradu

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VICTORIAOIL A.D.

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srdjan.popov@victoriagroup.rs

4 TRGOVAČKI KODOVI ZA POJEDINE TIPOVE PROIZVODA OD BIOMASE

4.1 Trgovački kodovi za poljoprivrednu biomasu biljnog porekla

RED BROJ	KOD	TIP PROIZVODA	KOD	POTKATEGORIJA (BILJNA VRSTA)	KOD	DEO BILJKE	KOD	FORMA BIOMASE	KOD	GUSTINA (KG/M ³)	KOD	VLAŽNOST	JED. MERE	TRGOVAČKI KOD
001	C	Žitarice	C1	Pšenica Ovas Ječam Raž, Pirinač	WP	Cela biljka	PE	Pelete	DP1	≤600	M15	≤15%	kg	C1_WP_PE_DP1_M15
002											M20	≤20%	kg	C1_WP_PE_DP1_M20
003									DP2	≥600	M15	≤15%	kg	C1_WP_PE_DP2_M15
004											M20	≤20%	kg	C1_WP_PE_DP2_M20
005							BR	Briketi	DB1	≤500	M15	≤15%	kg	C1_WP_BR_DB1_M15
006											M20	≤20%	kg	C1_WP_BR_DB1_M20
007									DB2	≥500	M15	≤15%	kg	C1_WP_BR_DB2_M15
008											M20	≤20%	kg	C1_WP_BR_DB2_M20
009							KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	C1_WP_KM_DK1_M25
010											M50	≤50%	kg	C1_WP_KM_DK1_M50
011									DK2	≥100	M25	≤25%	kg	C1_WP_KM_DK2_M25
012											M50	≤50%	kg	C1_WP_KM_DK2_M50
013							KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	C1_WP_KV_DK3_M25
014											M50	≤50%	kg	C1_WP_KV_DK3_M50
015									DK4	≥150	M25	≤25%	kg	C1_WP_KV_DK4_M25
016											M50	≤50%	kg	C1_WP_KV_DK4_M50
017							KU	Kvadar – velike bale -	DK3	≤150	M25	≤25%	kg	C1_WP_KU_DK3_M25

								usitnjena						
018											M50	≤50%	kg	C1_WP_KU_DK3_M50
019									DK4	≥150	M25	≤25%	kg	C1_WP_KU_DK4_M25
020											M50	≤50%	kg	C1_WP_KU_DK4_M50
021							RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	C1_WP_RM_DO1_M25
022											M50	≤50%	kg	C1_WP_RM_DO1_M50
023									DO2	≥100	M25	≤25%	kg	C1_WP_RM_DO2_M25
024											M50	≤50%	kg	C1_WP_RM_DO2_M50
025							RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	C1_WP_RV_DO1_M25
026											M50	≤50%	kg	C1_WP_RV_DO1_M50
027									DO2	≥100	M25	≤25%	kg	C1_WP_RV_DO2_M25
028											M50	≤50%	kg	C1_WP_RV_DO2_M50
029							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	C1_WP_RA_DR1_M25
030											M50	≤50%	kg	C1_WP_RA_DR1_M50
031									DR2	≥90	M25	≤25%	kg	C1_WP_RA_DR2_M25
032											M50	≤50%	kg	C1_WP_RA_DR2_M50
033							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	C1_WP_RU_DU1_M25
034											M50	≤50%	kg	C1_WP_RU_DU1_M50
035									DU2	≥100	M25	≤25%	kg	C1_WP_RU_DU2_M25
036											M50	≤50%	kg	C1_WP_RU_DU2_M50
037					SP	Stablo i list	PE	Pelete	DP1	≤600	M15	≤15%	kg	C1_SP_PE_DP1_M15
038											M20	≤20%	kg	C1_SP_PE_DP1_M20
039									DP2	≥600	M15	≤15%	kg	C1_SP_PE_DP2_M15
040											M20	≤20%	kg	C1_SP_PE_DP2_M20

031						BR	Brikete	DB1	≤500	M15	≤15%	kg	C1_SP_BR_DB1_M15
032										M20	≤20%	kg	C1_SP_BR_DB1_M20
033								DB2	≥500	M15	≤15%	kg	C1_SP_BR_DB2_M15
034										M20	≤20%	kg	C1_SP_BR_DB2_M20
035						KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	C1_SP_KM_DK1_M25
036										M50	≤50%	kg	C1_SP_KM_DK1_M50
037								DK2	≥100	M25	≤25%	kg	C1_SP_KM_DK2_M25
038										M50	≤50%	kg	C1_SP_KM_DK2_M50
039						KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	C1_SP_KV_DK3_M25
040										M50	≤50%	kg	C1_SP_KV_DK3_M50
041								DK4	≥150	M25	≤25%	kg	C1_SP_KV_DK4_M25
042										M50	≤50%	kg	C1_SP_KV_DK4_M50
043						KU	Kvadar – velike bale - usitnjena	DK3	≤150	M25	≤25%	kg	C1_SP_KU_DK3_M25
044										M50	≤50%	kg	C1_SP_KU_DK3_M50
045								DK4	≥150	M25	≤25%	kg	C1_SP_KU_DK4_M25
046										M50	≤50%	kg	C1_SP_KU_DK4_M50
047						RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	C1_SP_RM_DO1_M25
048										M50	≤50%	kg	C1_SP_RM_DO1_M50
049								DO2	≥100	M25	≤25%	kg	C1_SP_RM_DO2_M25
050										M50	≤50%	kg	C1_SP_RM_DO2_M50
051						RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	C1_SP_RV_DO1_M25
052										M50	≤50%	kg	C1_SP_RV_DO1_M50
053								DO2	≥100	M25	≤25%	kg	C1_SP_RV_DO2_M25
054										M50	≤50%	kg	C1_SP_RV_DO2_M50

055							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	C1_SP_RA_DR1_M25
056											M50	≤50%	kg	C1_WP_RA_DR1_M50
057									DR2	≥90	M25	≤25%	kg	C1_WP_RA_DR2_M25
058											M50	≤50%	kg	C1_WP_RA_DR2_M50
059							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	C1_WP_RU_DU1_M25
060											M50	≤50%	kg	C1_SP_RU_DU1_M50
061									DU2	≥100	M25	≤25%	kg	C1_SP_RU_DU2_M25
062											M50	≤50%	kg	C1_SP_RU_DU2_M50
063					GR	Zrnasti otpad	PE	Pelete	DP1	≤600	M15	≤15%	kg	C1_GR_PE_DP1_M15
064											M20	≤20%	kg	C1_GR_PE_DP1_M20
065									DP2	≥600	M15	≤15%	kg	C1_GR_PE_DP2_M15
066											M20	≤20%	kg	C1_GR_PE_DP2_M20
067							BR	Briketi	DB1	≤500	M15	≤15%	kg	C1_GR_BR_DB1_M15
068											M25	≤20%	kg	C1_GR_BR_DB1_M20
069									DB2	≥500	M15	≤15%	kg	C1_GR_BR_DB2_M15
070											M25	≤20%	kg	C1_GR_BR_DB2_M20
071							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤400	M15	≤15%	kg	C1_GR_RA_DR1_M15
072											M25	≤25%	kg	C1_GR_RA_DR1_M25
073											M35	≤35%	kg	C1_GR_RA_DR1_M35
074									DR2	≥400	M15	≤15%	kg	C1_GR_RA_DR2_M15
075											M25	≤25%	kg	C1_GR_RA_DR2_M25
076											M35	≤35%	kg	C1_GR_RA_DR2_M35
077							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤300	M15	≤15%	kg	C1_GR_RU_DU1_M15

078											M25	≤25%	kg	C1_GR_RU_DU1_M25
079											M35	≤35%	kg	C1_GR_RU_DU1_M35
080									DU2	≥300	M15	≤15%	kg	C1_GR_RU_DU2_M15
081											M25	≤25%	kg	C1_GR_RU_DU2_M25
082											M35	≤35%	kg	C1_GR_RU_DU2_M35
083			C2	Kukuruz	WP	Cela biljka	PE	Pelete	DP1	≤600	M15	≤15%	kg	C2_WP_PE_DP1_M15
084											M20	≤20%	kg	C2_WP_PE_DP1_M20
085									DP2	≥600	M15	≤15%	kg	C2_WP_PE_DP2_M15
086											M20	≤20%	kg	C2_WP_PE_DP2_M20
087							BR	Briketi	DB1	≤500	M15	≤15%	kg	C2_WP_BR_DB1_M15
088											M20	≤20%	kg	C2_WP_BR_DB1_M20
089									DB2	≥500	M15	≤15%	kg	C2_WP_BR_DB2_M15
090											M20	≤20%	kg	C2_WP_BR_DB2_M20
091							KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	C2_WP_KM_DK1_M25
092											M50	≤50%	kg	C2_WP_KM_DK1_M50
093									DK2	≥100	M25	≤25%	kg	C2_WP_KM_DK2_M25
094											M50	≤50%	kg	C2_WP_KM_DK2_M50
095							KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	C2_WP_KV_DK3_M25
096											M50	≤50%	kg	C2_WP_KV_DK3_M50
097									DK4	≥150	M25	≤25%	kg	C2_WP_KV_DK4_M25
098											M50	≤50%	kg	C2_WP_KV_DK4_M50
099							KU	Kvadar – velike bale - usitnjena	DK3	≤150	M25	≤25%	kg	C2_WP_KU_DK3_M25
100											M50	≤50%	kg	C2_WP_KU_DK3_M50
101									DK4	≥150	M25	≤25%	kg	C2_WP_KU_DK4_M25

102											M50	≤50%	kg	C2_WP_KU_DK4_M50
103							RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	C2_WP_RM_DO1_M25
104											M50	≤50%	kg	C2_WP_RM_DO1_M50
105									DO2	≥100	M25	≤25%	kg	C2_WP_RM_DO2_M25
106											M50	≤50%	kg	C2_WP_RM_DO2_M50
107							RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	C2_WP_RV_DO1_M25
108											M50	≤50%	kg	C2_WP_RV_DO1_M50
109									DO2	≥100	M25	≤25%	kg	C2_WP_RV_DO2_M25
110											M50	≤50%	kg	C2_WP_RV_DO2_M50
111							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	C2_WP_RA_DR1_M25
112											M50	≤50%	kg	C2_WP_RA_DR1_M50
113									DR2	≥90	M25	≤25%	kg	C2_WP_RA_DR2_M25
114											M50	≤50%	kg	C2_WP_RA_DR2_M50
115							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	C2_WP_RU_DU1_M25
116											M50	≤50%	kg	C2_WP_RU_DU1_M50
117									DU2	≥100	M25	≤25%	kg	C2_WP_RU_DU2_M25
118											M50	≤50%	kg	C2_WP_RU_DU2_M50
119					OK	Oklasak	PE	Pelete	DP1	≤600	M15	≤15%	kg	C2_OK_PE_DP1_M15
120											M20	≤20%	kg	C2_OK_PE_DP1_M20
121									DP2	≥600	M15	≤15%	kg	C2_OK_PE_DP2_M15
122											M20	≤20%	kg	C2_OK_PE_DP2_M20
123							BR	Briketi	DB1	≤500	M15	≤15%	kg	C2_OK_BR_DB1_M15
124											M20	≤20%	kg	C2_OK_BR_DB1_M20
125									DB2	≥500	M15	≤15%	kg	C2_OK_BR_DB2_M15

126											M20	≤20%	kg	C2_OK_BR_DB2_M20
127							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	C2_OK_RA_DR1_M25
128											M50	≤50%	kg	C2_OK_RA_DR1_M50
129									DR2	≥90	M25	≤25%	kg	C2_OK_RA_DR2_M25
130											M50	≤50%	kg	C2_OK_RA_DR2_M50
131							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	C2_OK_RU_DU1_M25
132											M50	≤50%	kg	C2_OK_RU_DU1_M50
133									DU2	≥100	M25	≤25%	kg	C2_OK_RU_DU2_M25
134											M50	≤50%	kg	C2_OK_RU_DU2_M50
135					SP	Stablo i list	PE	Pelete	DP1	≤600	M15	≤15%	kg	C2_SP_PE_DP1_M15
136											M20	≤20%	kg	C2_SP_PE_DP1_M20
137									DP2	≥600	M15	≤15%	kg	C2_SP_PE_DP2_M15
138											M20	≤20%	kg	C2_SP_PE_DP2_M20
139							BR	Briketi	DB1	≤500	M15	≤15%	kg	C21_SP_BR_DB1_M15
140											M20	≤20%	kg	C2_SP_BR_DB1_M20
141									DB2	≥500	M15	≤15%	kg	C2_SP_BR_DB2_M15
142											M20	≤20%	kg	C2_SP_BR_DB2_M20
143							KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	C2_SP_KM_DK1_M25
144											M50	≤50%	kg	C2_SP_KM_DK1_M50
145									DK2	≥100	M25	≤25%	kg	C2_SP_KM_DK2_M25
146											M50	≤50%	kg	C2_SP_KM_DK2_M50
147							KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	C2_SP_KV_DK3_M25
148											M50	≤50%	kg	C2_SP_KV_DK3_M50
149									DK4	≥150	M25	≤25%	kg	C2_SP_KV_DK4_M25

150											M50	≤50%	kg	C2_SP_KV_DK4_M50
151							KU	Kvadar – velike bale - usitnjena	DK3	≤150	M25	≤25%	kg	C2_SP_KU_DK3_M25
152											M50	≤50%	kg	C2_SP_KU_DK3_M50
153									DK4	≥150	M25	≤25%	kg	C2_SP_KU_DK4_M25
154											M50	≤50%	kg	C2_SP_KU_DK4_M50
155							RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	C2_SP_RM_DO1_M25
156											M50	≤50%	kg	C2_SP_RM_DO1_M50
157									DO2	≥100	M25	≤25%	kg	C2_SP_RM_DO2_M25
158											M50	≤50%	kg	C2_SP_RM_DO2_M50
159							RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	C2_SP_RV_DO1_M25
160											M50	≤50%	kg	C2_SP_RV_DO1_M50
161									DO2	≥100	M25	≤25%	kg	C2_SP_RV_DO2_M25
162											M50	≤50%	kg	C2_SP_RV_DO2_M50
163							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	C2_SP_RA_DR1_M25
164											M50	≤50%	kg	C2_WP_RA_DR1_M50
165									DR2	≥90	M25	≤25%	kg	C2_WP_RA_DR2_M25
166											M50	≤50%	kg	C2_WP_RA_DR2_M50
167							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	C2_WP_RU_DU1_M25
168											M50	≤50%	kg	C2_SP_RU_DU1_M50
169									DU2	≥100	M25	≤25%	kg	C2_SP_RU_DU2_M25
170											M50	≤50%	kg	C2_SP_RU_DU2_M50
171					GR	Zrnasti otpad	PE	Pelete	DP1	≤600	M15	≤15%	kg	C2_GR_PE_DP1_M15
172											M20	≤20%	kg	C2_GR_PE_DP1_M20
173									DP2	≥600	M15	≤15%	kg	C2_GR_PE_DP2_M15

174											M20	≤20%	kg	C2_GR_PE_DP2_M20
175							BR	Briketi	DB1	≤500	M15	≤15%	kg	C2_GR_BR_DB1_M15
176											M25	≤20%	kg	C2_GR_BR_DB1_M20
177									DB2	≥500	M15	≤15%	kg	C2_GR_BR_DB2_M15
178											M25	≤20%	kg	C2_GR_BR_DB2_M20
179							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤400	M15	≤15%	kg	C2_GR_RA_DR1_M15
180											M25	≤25%	kg	C2_GR_RA_DR1_M25
181											M35	≤35%	kg	C2_GR_RA_DR1_M35
182									DR2	≥400	M15	≤15%	kg	C2_GR_RA_DR2_M15
183											M25	≤25%	kg	C2_GR_RA_DR2_M25
184											M35	≤35%	kg	C2_GR_RA_DR2_M35
185							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤300	M15	≤15%	kg	C2_GR_RU_DU1_M15
186											M25	≤25%	kg	C2_GR_RU_DU1_M25
187											M35	≤35%	kg	C2_GR_RU_DU1_M35
188									DU2	≥300	M15	≤15%	kg	C2_GR_RU_DU2_M15
189											M25	≤25%	kg	C2_GR_RU_DU2_M25
190											M35	≤35%	kg	C2_GR_RU_DU2_M35
191			C3	Proso, Sirak	WP	Cela biljka	PE	Pelete	DP1	≤600	M15	≤15%	kg	C3_WP_PE_DP1_M15
192											M20	≤20%	kg	C3_WP_PE_DP1_M20
193									DP2	≥600	M15	≤15%	kg	C3_WP_PE_DP2_M15
194											M20	≤20%	kg	C3_WP_PE_DP2_M20
195							BR	Briketi	DB1	≤500	M15	≤15%	kg	C3_WP_BR_DB1_M15
196											M20	≤20%	kg	C3_WP_BR_DB1_M20

197									DB2	≥500	M15	≤15%	kg	C3_WP_BR_DB2_M15
198											M20	≤20%	kg	C3_WP_BR_DB2_M20
199							KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	C3_WP_KM_DK1_M25
200											M50	≤50%	kg	C3_WP_KM_DK1_M50
201									DK2	≥100	M25	≤25%	kg	C3_WP_KM_DK2_M25
202											M50	≤50%	kg	C3_WP_KM_DK2_M50
203							KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	C3_WP_KV_DK3_M25
204											M50	≤50%	kg	C3_WP_KV_DK3_M50
205									DK4	≥150	M25	≤25%	kg	C3_WP_KV_DK4_M25
206											M50	≤50%	kg	C3_WP_KV_DK4_M50
207							KU	Kvadar – velike bale - usitnjena	DK3	≤150	M25	≤25%	kg	C3_WP_KU_DK3_M25
208											M50	≤50%	kg	C3_WP_KU_DK3_M50
209									DK4	≥150	M25	≤25%	kg	C3_WP_KU_DK4_M25
210											M50	≤50%	kg	C3_WP_KU_DK4_M50
211							RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	C3_WP_RM_DO1_M25
212											M50	≤50%	kg	C3_WP_RM_DO1_M50
213									DO2	≥100	M25	≤25%	kg	C3_WP_RM_DO2_M25
214											M50	≤50%	kg	C3_WP_RM_DO2_M50
215							RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	C3_WP_RV_DO1_M25
216											M50	≤50%	kg	C3_WP_RV_DO1_M50
217									DO2	≥100	M25	≤25%	kg	C3_WP_RV_DO2_M25
218											M50	≤50%	kg	C3_WP_RV_DO2_M50
219							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	C3_WP_RA_DR1_M25
220											M50	≤50%	kg	C3_WP_RA_DR1_M50

221									DR2	≥90	M25	≤25%	kg	C3_WP_RA_DR2_M25
222											M50	≤50%	kg	C3_WP_RA_DR2_M50
223							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	C3_WP_RU_DU1_M25
224											M50	≤50%	kg	C3_WP_RU_DU1_M50
225									DU2	≥100	M25	≤25%	kg	C3_WP_RU_DU2_M25
226											M50	≤50%	kg	C3_WP_RU_DU2_M50
227					SP	Stablo i list	PE	Pelete	DP1	≤600	M15	≤15%	kg	C3_SP_PE_DP1_M15
228											M20	≤20%	kg	C3_SP_PE_DP1_M20
229									DP2	≥600	M15	≤15%	kg	C3_SP_PE_DP2_M15
230											M20	≤20%	kg	C3_SP_PE_DP2_M20
231							BR	Briketi	DB1	≤500	M15	≤15%	kg	C3_SP_BR_DB1_M15
232											M20	≤20%	kg	C3_SP_BR_DB1_M20
233									DB2	≥500	M15	≤15%	kg	C3_SP_BR_DB2_M15
234											M20	≤20%	kg	C3_SP_BR_DB2_M20
235							KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	C3_SP_KM_DK1_M25
236											M50	≤50%	kg	C3_SP_KM_DK1_M50
237									DK2	≥100	M25	≤25%	kg	C3_SP_KM_DK2_M25
238											M50	≤50%	kg	C3_SP_KM_DK2_M50
239							KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	C3_SP_KV_DK3_M25
240											M50	≤50%	kg	C3_SP_KV_DK3_M50
241									DK4	≥150	M25	≤25%	kg	C3_SP_KV_DK4_M25
242											M50	≤50%	kg	C3_SP_KV_DK4_M50
243							KU	Kvadar – velike bale - usitnjena	DK3	≤150	M25	≤25%	kg	C3_SP_KU_DK3_M25
244											M50	≤50%	kg	C3_SP_KU_DK3_M50

245									DK4	≥150	M25	≤25%	kg	C3_SP_KU_DK4_M25
246											M50	≤50%	kg	C3_SP_KU_DK4_M50
247							RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	C3_SP_RM_DO1_M25
248											M50	≤50%	kg	C3_SP_RM_DO1_M50
249									DO2	≥100	M25	≤25%	kg	C3_SP_RM_DO2_M25
250											M50	≤50%	kg	C3_SP_RM_DO2_M50
251							RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	C3_SP_RV_DO1_M25
252											M50	≤50%	kg	C3_SP_RV_DO1_M50
253									DO2	≥100	M25	≤25%	kg	C3_SP_RV_DO2_M25
254											M50	≤50%	kg	C3_SP_RV_DO2_M50
255							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	C3_SP_RA_DR1_M25
256											M50	≤50%	kg	C3_WP_RA_DR1_M50
257									DR2	≥90	M25	≤25%	kg	C3_WP_RA_DR2_M25
258											M50	≤50%	kg	C3_WP_RA_DR2_M50
259							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	C3_WP_RU_DU1_M25
260											M50	≤50%	kg	C3_SP_RU_DU1_M50
261									DU2	≥100	M25	≤25%	kg	C3_SP_RU_DU2_M25
262											M50	≤50%	kg	C3_SP_RU_DU2_M50
263					GR	Zrnasti otpad	PE	Pelete	DP1	≤600	M15	≤15%	kg	C3_GR_PE_DP1_M15
264											M20	≤20%	kg	C3_GR_PE_DP1_M20
265									DP2	≥600	M15	≤15%	kg	C3_GR_PE_DP2_M15
266											M20	≤20%	kg	C3_GR_PE_DP2_M20
267							BR	Briketi	DB1	≤500	M15	≤15%	kg	C3_GR_BR_DB1_M15
268											M25	≤20%	kg	C3_GR_BR_DB1_M20

269									DB2	≥500	M15	≤15%	kg	C3_GR_BR_DB2_M15
270											M25	≤20%	kg	C3_GR_BR_DB2_M20
271							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤400	M15	≤15%	kg	C3_GR_RA_DR1_M15
272											M25	≤25%	kg	C3_GR_RA_DR1_M25
273											M35	≤35%	kg	C3_GR_RA_DR1_M35
274									DR2	≥400	M15	≤15%	kg	C3_GR_RA_DR2_M15
275											M25	≤25%	kg	C3_GR_RA_DR2_M25
276											M35	≤35%	kg	C3_GR_RA_DR2_M35
277							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤300	M15	≤15%	kg	C3_GR_RU_DU1_M15
278											M25	≤25%	kg	C3_GR_RU_DU1_M25
279											M35	≤35%	kg	C3_GR_RU_DU1_M35
280									DU2	≥300	M15	≤15%	kg	C3_GR_RU_DU2_M15
281											M25	≤25%	kg	C3_GR_RU_DU2_M25
282											M35	≤35%	kg	C3_GR_RU_DU2_M35
283	G	Trave i drvenaste biljke	G1	Switchgrass	WP	Cele biljke	PE	Pelete	DP1	≤600	M15	≤15%	kg	G1_WP_PE_DP1_M15
284											M20	≤20%	kg	G1_WP_PE_DP1_M20
285									DP2	≥600	M15	≤15%	kg	G1_WP_PE_DP2_M15
286											M20	≤20%	kg	G1_WP_PE_DP2_M20
287							BR	Briketi	DB1	≤500	M15	≤15%	kg	G1_WP_BR_DB1_M15
288											M20	≤20%	kg	G1_WP_BR_DB1_M20
289									DB2	≥500	M15	≤15%	kg	G1_WP_BR_DB2_M15
290											M20	≤20%	kg	G1_WP_BR_DB2_M20
291							KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	G1_WP_KM_DK1_M25
292											M50	≤50%	kg	G1_WP_KM_DK1_M50

293									DK2	≥100	M25	≤25%	kg	G1_WP_KM_DK2_M25
294											M50	≤50%	kg	G1_WP_KM_DK2_M50
295							KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	G1_WP_KV_DK3_M25
296											M50	≤50%	kg	G1_WP_KV_DK3_M50
297									DK4	≥150	M25	≤25%	kg	G1_WP_KV_DK4_M25
298											M50	≤50%	kg	G1_WP_KV_DK4_M50
299							KU	Kvadar – velike bale - usitnjena	DK3	≤150	M25	≤25%	kg	G1_WP_KU_DK3_M25
300											M50	≤50%	kg	G1_WP_KU_DK3_M50
301									DK4	≥150	M25	≤25%	kg	G1_WP_KU_DK4_M25
302											M50	≤50%	kg	G1_WP_KU_DK4_M50
303							RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	G1_WP_RM_DO1_M25
304											M50	≤50%	kg	G1_WP_RM_DO1_M50
305									DO2	≥100	M25	≤25%	kg	G1_WP_RM_DO2_M25
306											M50	≤50%	kg	G1_WP_RM_DO2_M50
307							RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	G1_WP_RV_DO1_M25
308											M50	≤50%	kg	G1_WP_RV_DO1_M50
309									DO2	≥100	M25	≤25%	kg	G1_WP_RV_DO2_M25
310											M50	≤50%	kg	G1_WP_RV_DO2_M50
311							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	G1_WP_RA_DR1_M25
312											M50	≤50%	kg	G1_WP_RA_DR1_M50
313									DR2	≥90	M25	≤25%	kg	G1_WP_RA_DR2_M25
314											M50	≤50%	kg	G1_WP_RA_DR2_M50
315							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	G1_WP_RU_DU1_M25
316											M50	≤50%	kg	G1_WP_RU_DU1_M50

317									DU2	≥100	M25	≤25%	kg	G1_WP_RU_DU2_M25
318											M50	≤50%	kg	G1_WP_RU_DU2_M50
319			G2	Mischanthus	WP	Cele biljke	PE	Pelete	DP1	≤600	M15	≤15%	kg	G2_WP_PE_DP1_M15
320											M20	≤20%	kg	G2_WP_PE_DP1_M20
321									DP2	≥600	M15	≤15%	kg	G2_WP_PE_DP2_M15
322											M20	≤20%	kg	G2_WP_PE_DP2_M20
323							BR	Briketi	DB1	≤500	M15	≤15%	kg	G2_WP_BR_DB1_M15
324											M20	≤20%	kg	G2_WP_BR_DB1_M20
325									DB2	≥500	M15	≤15%	kg	G2_WP_BR_DB2_M15
326											M20	≤20%	kg	G2_WP_BR_DB2_M20
327							KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	G2_WP_KM_DK1_M25
328											M50	≤50%	kg	G2_WP_KM_DK1_M50
329									DK2	≥100	M25	≤25%	kg	G2_WP_KM_DK2_M25
330											M50	≤50%	kg	G2_WP_KM_DK2_M50
331							KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	G2_WP_KV_DK3_M25
332											M50	≤50%	kg	G2_WP_KV_DK3_M50
333									DK4	≥150	M25	≤25%	kg	G2_WP_KV_DK4_M25
334											M50	≤50%	kg	G2_WP_KV_DK4_M50
335							KU	Kvadar – velike bale - usitnjena	DK3	≤150	M25	≤25%	kg	G2_WP_KU_DK3_M25
336											M50	≤50%	kg	G2_WP_KU_DK3_M50
337									DK4	≥150	M25	≤25%	kg	G2_WP_KU_DK4_M25
338											M50	≤50%	kg	G2_WP_KU_DK4_M50
339							RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	G2_WP_RM_DO1_M25
340											M50	≤50%	kg	G2_WP_RM_DO1_M50

341									DO2	≥100	M25	≤25%	kg	G2_WP_RM_DO2_M25
342											M50	≤50%	kg	G2_WP_RM_DO2_M50
343							RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	G2_WP_RV_DO1_M25
344											M50	≤50%	kg	G2_WP_RV_DO1_M50
345									DO2	≥100	M25	≤25%	kg	G2_WP_RV_DO2_M25
346											M50	≤50%	kg	G2_WP_RV_DO2_M50
347							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	G2_WP_RA_DR1_M25
348											M50	≤50%	kg	G2_WP_RA_DR1_M50
349									DR2	≥90	M25	≤25%	kg	G2_WP_RA_DR2_M25
350											M50	≤50%	kg	G2_WP_RA_DR2_M50
351							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	G2_WP_RU_DU1_M25
352											M50	≤50%	kg	G2_WP_RU_DU1_M50
353									DU2	≥100	M25	≤25%	kg	G2_WP_RU_DU2_M25
354											M50	≤50%	kg	G2_WP_RU_DU2_M50
355			G3	Drvenasto bilje	WP	Cela biljka	PE	Pelete	DP1	≤600	M15	≤15%	kg	G2_WP_PE_DP1_M15
356											M20	≤20%	kg	G2_WP_PE_DP1_M20
357									DP2	≥600	M15	≤15%	kg	G2_WP_PE_DP2_M15
358											M20	≤20%	kg	G2_WP_PE_DP2_M20
359							BR	Briketi	DB1	≤500	M15	≤15%	kg	G2_WP_BR_DB1_M15
360											M20	≤20%	kg	G2_WP_BR_DB1_M20
361									DB2	≥500	M15	≤15%	kg	G2_WP_BR_DB2_M15
362											M20	≤20%	kg	G2_WP_BR_DB2_M20
363							RV	Rol – velike bale	DO1	≤160	M25	≤25%	kg	G2_WP_RV_DO1_M25
364											M50	≤50%	kg	G2_WP_RV_DO1_M50

365									DO2	≥160	M25	≤25%	kg	G2_WP_RV_DO2_M25
366											M50	≤50%	kg	G2_WP_RV_DO2_M50
367							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤300	M25	≤25%	kg	G2_WP_RA_DR1_M25
368											M50	≤50%	kg	G2_WP_RA_DR1_M50
369									DR2	≥300	M25	≤25%	kg	G2_WP_RA_DR2_M25
370											M50	≤50%	kg	G2_WP_RA_DR2_M50
371							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤300	M25	≤25%	kg	G2_WP_RU_DU1_M25
372											M50	≤50%	kg	G2_WP_RU_DU1_M50
373									DU2	≥300	M25	≤25%	kg	G2_WP_RU_DU2_M25
374											M50	≤50%	kg	G2_WP_RU_DU2_M50
375	O	Uljarice	O1	Soja	WP	Cela biljka	PE	Pelete	DP1	≤600	M15	≤15%	kg	O1_WP_PE_DP1_M15
376											M20	≤20%	kg	O1_WP_PE_DP1_M20
377									DP2	≥600	M15	≤15%	kg	O1_WP_PE_DP2_M15
378											M20	≤20%	kg	O1_WP_PE_DP2_M20
379							BR	Briketi	DB1	≤500	M15	≤15%	kg	O1_WP_BR_DB1_M15
380											M20	≤20%	kg	O1_WP_BR_DB1_M20
381									DB2	≥500	M15	≤15%	kg	O1_WP_BR_DB2_M15
382											M20	≤20%	kg	O1_WP_BR_DB2_M20
383							KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	O1_WP_KM_DK1_M25
384											M50	≤50%	kg	O1_WP_KM_DK1_M50
385									DK2	≥100	M25	≤25%	kg	O1_WP_KM_DK2_M25
386											M50	≤50%	kg	O1_WP_KM_DK2_M50
387							KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	O1_WP_KV_DK3_M25
388											M50	≤50%	kg	O1_WP_KV_DK3_M50

389									DK4	≥150	M25	≤25%	kg	O1_WP_KV_DK4_M25
390											M50	≤50%	kg	O1_WP_KV_DK4_M50
391							KU	Kvadar – velike bale - usitnjena	DK3	≤150	M25	≤25%	kg	O1_WP_KU_DK3_M25
392											M50	≤50%	kg	O1_WP_KU_DK3_M50
393									DK4	≥150	M25	≤25%	kg	O1_WP_KU_DK4_M25
394											M50	≤50%	kg	O1_WP_KU_DK4_M50
395							RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	O1_WP_RM_DO1_M25
396											M50	≤50%	kg	O1_WP_RM_DO1_M50
397									DO2	≥100	M25	≤25%	kg	O1_WP_RM_DO2_M25
398											M50	≤50%	kg	O1_WP_RM_DO2_M50
399							RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	O1_WP_RV_DO1_M25
400											M50	≤50%	kg	O1_WP_RV_DO1_M50
401									DO2	≥100	M25	≤25%	kg	O1_WP_RV_DO2_M25
402											M50	≤50%	kg	O1_WP_RV_DO2_M50
403							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	O1_WP_RA_DR1_M25
404											M50	≤50%	kg	O1_WP_RA_DR1_M50
405									DR2	≥90	M25	≤25%	kg	O1_WP_RA_DR2_M25
406											M50	≤50%	kg	O1_WP_RA_DR2_M50
407							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	O1_WP_RU_DU1_M25
408											M50	≤50%	kg	O1_WP_RU_DU1_M50
409									DU2	≥100	M25	≤25%	kg	O1_WP_RU_DU2_M25
410											M50	≤50%	kg	O1_WP_RU_DU2_M50
411					SL	Stablo i lišće	PE	Pelete	DP1	≤600	M15	≤15%	kg	O1_SL_PE_DP1_M15
412											M20	≤20%	kg	O1_SL_PE_DP1_M20

413									DP2	≥600	M15	≤15%	kg	O1_SL_PE_DP2_M15
414											M20	≤20%	kg	O1_SL_PE_DP2_M20
415							BR	Briketi	DB1	≤500	M15	≤15%	kg	O1_SL_BR_DB1_M15
416											M20	≤20%	kg	O1_SL_BR_DB1_M20
417									DB2	≥500	M15	≤15%	kg	O1_SL_BR_DB2_M15
418											M20	≤20%	kg	O1_SL_BR_DB2_M20
419							KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	O1_SL_KM_DK1_M25
420											M50	≤50%	kg	O1_SL_KM_DK1_M50
421									DK2	≥100	M25	≤25%	kg	O1_SL_KM_DK2_M25
422											M50	≤50%	kg	O1_SL_KM_DK2_M50
423							KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	O1_SL_KV_DK3_M25
424											M50	≤50%	kg	O1_SL_KV_DK3_M50
425									DK4	≥150	M25	≤25%	kg	O1_SL_KV_DK4_M25
426											M50	≤50%	kg	O1_SL_KV_DK4_M50
427							KU	Kvadar – velike bale - usitnjena	DK3	≤150	M25	≤25%	kg	O1_SL_KU_DK3_M25
428											M50	≤50%	kg	O1_SL_KU_DK3_M50
429									DK4	≥150	M25	≤25%	kg	O1_SL_KU_DK4_M25
430											M50	≤50%	kg	O1_SL_KU_DK4_M50
431							RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	O1_SL_RM_DO1_M25
432											M50	≤50%	kg	O1_SL_RM_DO1_M50
433									DO2	≥100	M25	≤25%	kg	O1_SL_RM_DO2_M25
434											M50	≤50%	kg	O1_SL_RM_DO2_M50
435							RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	O1_SL_RV_DO1_M25
436											M50	≤50%	kg	O1_SL_RV_DO1_M50

437									DO2	≥100	M25	≤25%	kg	O1_SL_RV_DO2_M25
438											M50	≤50%	kg	O1_SL_RV_DO2_M50
439							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	O1_SL_RA_DR1_M25
440											M50	≤50%	kg	O1_SL_RA_DR1_M50
441									DR2	≥90	M25	≤25%	kg	O1_SL_RA_DR2_M25
442											M50	≤50%	kg	O1_SL_RA_DR2_M50
443							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	O1_SL_RU_DU1_M25
444											M50	≤50%	kg	O1_SL_RU_DU1_M50
445									DU2	≥100	M25	≤25%	kg	O1_SL_RU_DU2_M25
446											M50	≤50%	kg	O1_SL_RU_DU2_M50
447					SH	Ljuske i zrnasti otpad	PE	Pelete	DP1	≤600	M15	≤15%	kg	O1_SH_PE_DP1_M15
448											M20	≤20%	kg	O1_SH_PE_DP1_M20
449									DP2	≥600	M15	≤15%	kg	O1_SH_PE_DP2_M15
450											M20	≤20%	kg	O1_SH_PE_DP2_M20
451							BR	Briketi	DB1	≤500	M15	≤15%	kg	O1_SH_BR_DB1_M15
452											M25	≤25%	kg	O1_SH_BR_DB1_M25
453									DB2	≥500	M15	≤15%	kg	O1_SH_BR_DB2_M15
454											M25	≤25%	kg	O1_SH_BR_DB2_M25
455							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤400	M15	≤15%	kg	O1_SH_RA_DR1_M15
456											M25	≤25%	kg	O1_SH_RA_DR1_M25
457											M35	≤35%	kg	O1_SH_RA_DR1_M35
458									DR2	≥400	M15	≤15%	kg	O1_SH_RA_DR2_M15
459											M25	≤25%	kg	O1_SH_RA_DR2_M25

460											M35	≤35%	kg	O1_SH_RA_DR2_M35
461							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤300	M15	≤15%	kg	O1_SH_RU_DU1_M15
462											M25	≤25%	kg	O1_SH_RU_DU1_M25
463											M35	≤35%	kg	O1_SH_RU_DU1_M35
464									DU2	≥300	M15	≤15%	kg	O1_SH_RU_DU2_M15
465											M25	≤25%	kg	O1_SH_RU_DU2_M25
466											M35	≤35%	kg	O1_SH_RU_DU2_M35
467			O2	Uljana repica, Lan, Ricinus	WP	Cela biljka	PE	Pelete	DP1	≤600	M15	≤15%	kg	O2_WP_PE_DP1_M15
468											M20	≤20%	kg	O2_WP_PE_DP1_M20
469									DP2	≥600	M15	≤15%	kg	O2_WP_PE_DP2_M15
470											M20	≤20%	kg	O2_WP_PE_DP2_M20
471							BR	Briketi	DB1	≤500	M15	≤15%	kg	O2_WP_BR_DB1_M15
472											M20	≤20%	kg	O2_WP_BR_DB1_M20
473									DB2	≥500	M15	≤15%	kg	O2_WP_BR_DB2_M15
474											M20	≤20%	kg	O2_WP_BR_DB2_M20
475							KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	O2_WP_KM_DK1_M25
476											M50	≤50%	kg	O2_WP_KM_DK1_M50
477									DK2	≥100	M25	≤25%	kg	O2_WP_KM_DK2_M25
478											M50	≤50%	kg	O2_WP_KM_DK2_M50
479							KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	O2_WP_KV_DK3_M25
480											M50	≤50%	kg	O2_WP_KV_DK3_M50
481									DK4	≥150	M25	≤25%	kg	O2_WP_KV_DK4_M25
482											M50	≤50%	kg	O2_WP_KV_DK4_M50

483							KU	Kvadar – velike bale - usitnjena	DK3	≤150	M25	≤25%	kg	O2_WP_KU_DK3_M25
484											M50	≤50%	kg	O2_WP_KU_DK3_M50
485									DK4	≥150	M25	≤25%	kg	O2_WP_KU_DK4_M25
486											M50	≤50%	kg	O2_WP_KU_DK4_M50
487							RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	O2_WP_RM_DO1_M25
488											M50	≤50%	kg	O2_WP_RM_DO1_M50
489									DO2	≥100	M25	≤25%	kg	O2_WP_RM_DO2_M25
490											M50	≤50%	kg	O2_WP_RM_DO2_M50
491							RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	O2_WP_RV_DO1_M25
492											M50	≤50%	kg	O2_WP_RV_DO1_M50
493									DO2	≥100	M25	≤25%	kg	O2_WP_RV_DO2_M25
494											M50	≤50%	kg	O2_WP_RV_DO2_M50
495							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	O2_WP_RA_DR1_M25
496											M50	≤50%	kg	O2_WP_RA_DR1_M50
497									DR2	≥90	M25	≤25%	kg	O2_WP_RA_DR2_M25
498											M50	≤50%	kg	O2_WP_RA_DR2_M50
499							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	O2_WP_RU_DU1_M25
500											M50	≤50%	kg	O2_WP_RU_DU1_M50
501									DU2	≥100	M25	≤25%	kg	O2_WP_RU_DU2_M25
502											M50	≤50%	kg	O2_WP_RU_DU2_M50
503					SL	Stablo i lišće	PE	Pelete	DP1	≤600	M15	≤15%	kg	O2_SL_PE_DP1_M15
504											M20	≤20%	kg	O2_SL_PE_DP1_M20
505									DP2	≥600	M15	≤15%	kg	O2_SL_PE_DP2_M15
506											M20	≤20%	kg	O2_SL_PE_DP2_M20

507						BR	Briket	DB1	≤500	M15	≤15%	kg	O2_SL_BR_DB1_M15
508										M20	≤20%	kg	O2_SL_BR_DB1_M20
509								DB2	≥500	M15	≤15%	kg	O2_SL_BR_DB2_M15
510										M20	≤20%	kg	O2_SL_BR_DB2_M20
511						KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	O2_SL_KM_DK1_M25
512										M50	≤50%	kg	O2_SL_KM_DK1_M50
513								DK2	≥100	M25	≤25%	kg	O2_SL_KM_DK2_M25
514										M50	≤50%	kg	O2_SL_KM_DK2_M50
515						KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	O2_SL_KV_DK3_M25
516										M50	≤50%	kg	O2_SL_KV_DK3_M50
517								DK4	≥150	M25	≤25%	kg	O2_SL_KV_DK4_M25
518										M50	≤50%	kg	O2_SL_KV_DK4_M50
519						KU	Kvadar – velike bale - usitnjena	DK3	≤150	M25	≤25%	kg	O2_SL_KU_DK3_M25
520										M50	≤50%	kg	O2_SL_KU_DK3_M50
521								DK4	≥150	M25	≤25%	kg	O2_SL_KU_DK4_M25
522										M50	≤50%	kg	O2_SL_KU_DK4_M50
523						RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	O2_SL_RM_DO1_M25
524										M50	≤50%	kg	O2_SL_RM_DO1_M50
525								DO2	≥100	M25	≤25%	kg	O2_SL_RM_DO2_M25
526										M50	≤50%	kg	O2_SL_RM_DO2_M50
527						RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	O2_SL_RV_DO1_M25
528										M50	≤50%	kg	O2_SL_RV_DO1_M50
529								DO2	≥100	M25	≤25%	kg	O2_SL_RV_DO2_M25
530										M50	≤50%	kg	O2_SL_RV_DO2_M50

531							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	O2_SL_RA_DR1_M25
532											M50	≤50%	kg	O2_SL_RA_DR1_M50
533									DR2	≥90	M25	≤25%	kg	O2_SL_RA_DR2_M25
534											M50	≤50%	kg	O2_SL_RA_DR2_M50
535							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	O2_SL_RU_DU1_M25
536											M50	≤50%	kg	O2_SL_RU_DU1_M50
537									DU2	≥100	M25	≤25%	kg	O2_SL_RU_DU2_M25
538											M50	≤50%	kg	O2_SL_RU_DU2_M50
539					SH	Ljuske i zrnasti otpad	PE	Pelete	DP1	≤600	M15	≤15%	kg	O2_SH_PE_DP1_M15
540											M20	≤20%	kg	O2_SH_PE_DP1_M20
541									DP2	≥600	M15	≤15%	kg	O2_SH_PE_DP2_M15
542											M20	≤20%	kg	O2_SH_PE_DP2_M20
543							BR	Briketi	DB1	≤500	M15	≤15%	kg	O2_SH_BR_DB1_M15
544											M25	≤25%	kg	O2_SH_BR_DB1_M25
545									DB2	≥500	M15	≤15%	kg	O2_SH_BR_DB2_M15
546											M25	≤25%	kg	O2_SH_BR_DB2_M25
547							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤400	M15	≤15%	kg	O2_SH_RA_DR1_M15
548											M25	≤25%	kg	O2_SH_RA_DR1_M25
549											M35	≤35%	kg	O2_SH_RA_DR1_M35
550									DR2	≥400	M15	≤15%	kg	O2_SH_RA_DR2_M15
551											M25	≤25%	kg	O2_SH_RA_DR2_M25
552											M35	≤35%	kg	O2_SH_RA_DR2_M35
553							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤300	M15	≤15%	kg	O2_SH_RU_DU1_M15

554											M25	≤25%	kg	O2_SH_RU_DU1_M25
555											M35	≤35%	kg	O2_SH_RU_DU1_M35
556									DU2	≥300	M15	≤15%	kg	O2_SH_RU_DU2_M15
557											M25	≤25%	kg	O2_SH_RU_DU2_M25
558											M35	≤35%	kg	O2_SH_RU_DU2_M35
559			O3	Suncokret	WP	Cela biljka	PE	Pelete	DP1	≤600	M15	≤15%	kg	O3_WP_PE_DP1_M15
560											M20	≤20%	kg	O3_WP_PE_DP1_M20
561									DP2	≥600	M15	≤15%	kg	O3_WP_PE_DP2_M15
562											M20	≤20%	kg	O3_WP_PE_DP2_M20
563							BR	Briketi	DB1	≤500	M15	≤15%	kg	O3_WP_BR_DB1_M15
564											M20	≤20%	kg	O3_WP_BR_DB1_M20
565									DB2	≥500	M15	≤15%	kg	O3_WP_BR_DB2_M15
566											M20	≤20%	kg	O3_WP_BR_DB2_M20
567							KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	O3_WP_KM_DK1_M25
568											M50	≤50%	kg	O3_WP_KM_DK1_M50
569									DK2	≥100	M25	≤25%	kg	O3_WP_KM_DK2_M25
570											M50	≤50%	kg	O3_WP_KM_DK2_M50
571							KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	O3_WP_KV_DK3_M25
572											M50	≤50%	kg	O3_WP_KV_DK3_M50
573									DK4	≥150	M25	≤25%	kg	O3_WP_KV_DK4_M25
574											M50	≤50%	kg	O3_WP_KV_DK4_M50
575							KU	Kvadar – velike bale - usitnjena	DK3	≤150	M25	≤25%	kg	O3_WP_KU_DK3_M25
576											M50	≤50%	kg	O3_WP_KU_DK3_M50
577									DK4	≥150	M25	≤25%	kg	O3_WP_KU_DK4_M25

578											M50	≤50%	kg	O3_WP_KU_DK4_M50
579							RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	O3_WP_RM_DO1_M25
580											M50	≤50%	kg	O3_WP_RM_DO1_M50
581									DO2	≥100	M25	≤25%	kg	O3_WP_RM_DO2_M25
582											M50	≤50%	kg	O3_WP_RM_DO2_M50
583							RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	O3_WP_RV_DO1_M25
584											M50	≤50%	kg	O3_WP_RV_DO1_M50
585									DO2	≥100	M25	≤25%	kg	O3_WP_RV_DO2_M25
586											M50	≤50%	kg	O3_WP_RV_DO2_M50
587							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	O3_WP_RA_DR1_M25
588											M50	≤50%	kg	O3_WP_RA_DR1_M50
589									DR2	≥90	M25	≤25%	kg	O3_WP_RA_DR2_M25
590											M50	≤50%	kg	O3_WP_RA_DR2_M50
591							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	O3_WP_RU_DU1_M25
592											M50	≤50%	kg	O3_WP_RU_DU1_M50
593									DU2	≥100	M25	≤25%	kg	O3_WP_RU_DU2_M25
594											M50	≤50%	kg	O3_WP_RU_DU2_M50
595					SL	Stablo i lišće	PE	Pelete	DP1	≤600	M15	≤15%	kg	O3_SL_PE_DP1_M15
596											M20	≤20%	kg	O3_SL_PE_DP1_M20
597									DP2	≥600	M15	≤15%	kg	O3_SL_PE_DP2_M15
598											M20	≤20%	kg	O3_SL_PE_DP2_M20
599							BR	Briketi	DB1	≤500	M15	≤15%	kg	O3_SL_BR_DB1_M15
600											M20	≤20%	kg	O3_SL_BR_DB1_M20
601									DB2	≥500	M15	≤15%	kg	O3_SL_BR_DB2_M15

602											M20	≤20%	kg	O3_SL_BR_DB2_M20
603							KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	O3_SL_KM_DK1_M25
604											M50	≤50%	kg	O3_SL_KM_DK1_M50
605									DK2	≥100	M25	≤25%	kg	O3_SL_KM_DK2_M25
606											M50	≤50%	kg	O3_SL_KM_DK2_M50
607							KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	O3_SL_KV_DK3_M25
608											M50	≤50%	kg	O3_SL_KV_DK3_M50
609									DK4	≥150	M25	≤25%	kg	O3_SL_KV_DK4_M25
610											M50	≤50%	kg	O3_SL_KV_DK4_M50
611							KU	Kvadar – velike bale - usitnjena	DK3	≤150	M25	≤25%	kg	O3_SL_KU_DK3_M25
612											M50	≤50%	kg	O3_SL_KU_DK3_M50
613									DK4	≥150	M25	≤25%	kg	O3_SL_KU_DK4_M25
614											M50	≤50%	kg	O3_SL_KU_DK4_M50
615							RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	O3_SL_RM_DO1_M25
616											M50	≤50%	kg	O3_SL_RM_DO1_M50
617									DO2	≥100	M25	≤25%	kg	O3_SL_RM_DO2_M25
618											M50	≤50%	kg	O3_SL_RM_DO2_M50
619							RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	O3_SL_RV_DO1_M25
620											M50	≤50%	kg	O3_SL_RV_DO1_M50
621									DO2	≥100	M25	≤25%	kg	O3_SL_RV_DO2_M25
622											M50	≤50%	kg	O3_SL_RV_DO2_M50
623							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	O3_SL_RA_DR1_M25
624											M50	≤50%	kg	O3_SL_RA_DR1_M50
625									DR2	≥90	M25	≤25%	kg	O3_SL_RA_DR2_M25

626											M50	≤50%	kg	O3_SL_RA_DR2_M50
627							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	O3_SL_RU_DU1_M25
628											M50	≤50%	kg	O3_SL_RU_DU1_M50
629									DU2	≥100	M25	≤25%	kg	O3_SL_RU_DU2_M25
630											M50	≤50%	kg	O3_SL_RU_DU2_M50
631					SH	Ljuske i zrnasti otpad	PE	Pelete	DP1	≤600	M15	≤15%	kg	O3_SH_PE_DP1_M15
632											M20	≤20%	kg	O3_SH_PE_DP1_M20
633									DP2	≥600	M15	≤15%	kg	O3_SH_PE_DP2_M15
634											M20	≤20%	kg	O3_SH_PE_DP2_M20
635							BR	Briketi	DB1	≤500	M15	≤15%	kg	O3_SH_BR_DB1_M15
636											M25	≤25%	kg	O3_SH_BR_DB1_M25
637									DB2	≥500	M15	≤15%	kg	O3_SH_BR_DB2_M15
638											M25	≤25%	kg	O3_SH_BR_DB2_M25
639							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤400	M15	≤15%	kg	O3_SH_RA_DR1_M15
640											M25	≤25%	kg	O3_SH_RA_DR1_M25
641											M35	≤35%	kg	O3_SH_RA_DR1_M35
642									DR2	≥400	M15	≤15%	kg	O3_SH_RA_DR2_M15
643											M25	≤25%	kg	O3_SH_RA_DR2_M25
644											M35	≤35%	kg	O3_SH_RA_DR2_M35
645							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤300	M15	≤15%	kg	O3_SH_RU_DU1_M15
646											M25	≤25%	kg	O3_SH_RU_DU1_M25
647											M35	≤35%	kg	O3_SH_RU_DU1_M35
648									DU2	≥300	M15	≤15%	kg	O3_SH_RU_DU2_M15

649											M25	≤25%	kg	O3_SH_RU_DU2_M25
650											M35	≤35%	kg	R1_SH_RU_DU2_M35
651	R	Povrće i korenasto povrće	R1	Šećerna repa, Ostaci povrća	RP	Ostaci biljaka	RA	Biomasa u rasutom stanju (rinfuz)	-	-	M25	≤25%	kg	R1_WP_RA_M25
652									-	-	M50	≤50%	kg	R1_WP_RA_M50
653									-	-	M80	≤80%	kg	R1_WP_RA_M80
654									-	-	M25	≤25%	kg	R1_WP_RA_M25
655									-	-	M50	≤50%	kg	R1_WP_RA_M50
656									-	-	M80	≤80%	kg	R1_WP_RA_M80
657							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	-	-	M25	≤25%	kg	R1_WP_RU_M25
658									-	-	M50	≤50%	kg	R1_WP_RU_M50
659									-	-	M80	≤80%	kg	R1_WP_RA_M80
660									-	-	M25	≤25%	kg	R1_WP_RU_M25
661									-	-	M50	≤50%	kg	R1_WP_RU_M50
662									-	-	M80	≤80%	kg	R1_WP_RA_M80
663	L	Leguminozne biljke	L1	Pasulj, Bob, Grašak, Kikiriki, Naut (leblebija), Sočivo (leća)	WP	Cela biljka	PE	Pelete	DP1	≤600	M15	≤15%	kg	L1_WP_PE_DP1_M15
664											M20	≤20%	kg	L1_WP_PE_DP1_M20
665									DP2	≥600	M15	≤15%	kg	L1_WP_PE_DP2_M15
666											M20	≤20%	kg	L1_WP_PE_DP2_M20
667							BR	Briketi	DB1	≤500	M15	≤15%	kg	L1_WP_BR_DB1_M15
668											M20	≤20%	kg	L1_WP_BR_DB1_M20
669									DB2	≥500	M15	≤15%	kg	L1_WP_BR_DB2_M15

670											M20	≤20%	kg	L1_WP_BR_DB2_M20
671							KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	L1_WP_KM_DK1_M25
672											M50	≤50%	kg	L1_WP_KM_DK1_M50
673									DK2	≥100	M25	≤25%	kg	L1_WP_KM_DK2_M25
674											M50	≤50%	kg	L1_WP_KM_DK2_M50
675							KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	L1_WP_KV_DK3_M25
676											M50	≤50%	kg	L1_WP_KV_DK3_M50
677									DK4	≥150	M25	≤25%	kg	L1_WP_KV_DK4_M25
678											M50	≤50%	kg	L1_WP_KV_DK4_M50
679							KU	Kvadar – velike bale - usitnjena	DK3	≤150	M25	≤25%	kg	L1_WP_KU_DK3_M25
680											M50	≤50%	kg	L1_WP_KU_DK3_M50
681									DK4	≥150	M25	≤25%	kg	L1_WP_KU_DK4_M25
682											M50	≤50%	kg	L1_WP_KU_DK4_M50
683							RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	L1_WP_RM_DO1_M25
684											M50	≤50%	kg	L1_WP_RM_DO1_M50
685									DO2	≥100	M25	≤25%	kg	L1_WP_RM_DO2_M25
686											M50	≤50%	kg	L1_WP_RM_DO2_M50
687							RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	L1_WP_RV_DO1_M25
688											M50	≤50%	kg	L1_WP_RV_DO1_M50
689									DO2	≥100	M25	≤25%	kg	L1_WP_RV_DO2_M25
690											M50	≤50%	kg	L1_WP_RV_DO2_M50
691							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	L1_WP_RA_DR1_M25
692											M50	≤50%	kg	L1_WP_RA_DR1_M50
693									DR2	≥90	M25	≤25%	kg	L1_WP_RA_DR2_M25

694										M50	≤50%	kg	L1_WP_RA_DR2_M50
695						RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	L1_WP_RU_DU1_M25
696										M50	≤50%	kg	L1_WP_RU_DU1_M50
697								DU2	≥100	M25	≤25%	kg	L1_WP_RU_DU2_M25
698										M50	≤50%	kg	L1_WP_RU_DU2_M50
699				SL	Stablo i lišće	PE	Pelete	DP1	≤600	M15	≤15%	kg	L1_SL_PE_DP1_M15
700										M20	≤20%	kg	L1_SL_PE_DP1_M20
701								DP2	≥600	M15	≤15%	kg	L1_SL_PE_DP2_M15
702										M20	≤20%	kg	L1_SL_PE_DP2_M20
703						BR	Briketi	DB1	≤500	M15	≤15%	kg	L1_SL_BR_DB1_M15
704										M20	≤20%	kg	L1_SL_BR_DB1_M20
705								DB2	≥500	M15	≤15%	kg	L1_SL_BR_DB2_M15
706										M20	≤20%	kg	L1_SL_BR_DB2_M20
707						KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	L1_SL_KM_DK1_M25
708										M50	≤50%	kg	L1_SL_KM_DK1_M50
709								DK2	≥100	M25	≤25%	kg	L1_SL_KM_DK2_M25
710										M50	≤50%	kg	L1_SL_KM_DK2_M50
711						KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	L1_SL_KV_DK3_M25
712										M50	≤50%	kg	L1_SL_KV_DK3_M50
713								DK4	≥150	M25	≤25%	kg	L1_SL_KV_DK4_M25
714										M50	≤50%	kg	L1_SL_KV_DK4_M50
715						KU	Kvadar – velike bale - usitnjena	DK3	≤150	M25	≤25%	kg	L1_SL_KU_DK3_M25
716										M50	≤50%	kg	L1_SL_KU_DK3_M50
717								DK4	≥150	M25	≤25%	kg	L1_SL_KU_DK4_M25

718											M50	≤50%	kg	L1_SL_KU_DK4_M50
719							RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	L1_SL_RM_DO1_M25
720											M50	≤50%	kg	L1_SL_RM_DO1_M50
721									DO2	≥100	M25	≤25%	kg	L1_SL_RM_DO2_M25
722											M50	≤50%	kg	L1_SL_RM_DO2_M50
723							RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	L1_SL_RV_DO1_M25
724											M50	≤50%	kg	L1_SL_RV_DO1_M50
725									DO2	≥100	M25	≤25%	kg	L1_SL_RV_DO2_M25
726											M50	≤50%	kg	L1_SL_RV_DO2_M50
727							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	L1_SL_RA_DR1_M25
728											M50	≤50%	kg	L1_SL_RA_DR1_M50
729									DR2	≥90	M25	≤25%	kg	L1_SL_RA_DR2_M25
730											M50	≤50%	kg	L1_SL_RA_DR2_M50
731							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	L1_SL_RU_DU1_M25
732											M50	≤50%	kg	L1_SL_RU_DU1_M50
733									DU2	≥100	M25	≤25%	kg	L1_SL_RU_DU2_M25
734											M50	≤50%	kg	L1_SL_RU_DU2_M50
735	H	Ostaci zeljastih biljaka iz vrtova, parkova, održavanja puteva, voćnjaka i vinograda	H1	Trave	WP	Cele biljke	PE	Pelete	DP1	≤600	M15	≤15%	kg	H1_WP_PE_DP1_M15
736											M20	≤20%	kg	H1_WP_PE_DP1_M20
737									DP2	≥600	M15	≤15%	kg	H1_WP_PE_DP2_M15
738											M20	≤20%	kg	H1_WP_PE_DP2_M20
739							BR	Briketi	DB1	≤500	M20	≤20%	kg	H1_WP_BR_DB1_M20
740											M20	≤20%	kg	H1_WP_BR_DB1_M20
741									DB2	≥500	M20	≤20%	kg	H1_WP_BR_DB2_M20

742											M20	≤20%	kg	H1_WP_BR_DB2_M20
743							KM	Kvadar – male bale	DK1	≤100	M25	≤25%	kg	H1_WP_KM_DK1_M25
744											M50	≤50%	kg	H1_WP_KM_DK1_M50
745									DK2	≥100	M25	≤25%	kg	H1_WP_KM_DK2_M25
746											M50	≤50%	kg	H1_WP_KM_DK2_M50
747							KV	Kvadar – velike bale	DK3	≤150	M25	≤25%	kg	H1_WP_KV_DK3_M25
748											M50	≤50%	kg	H1_WP_KV_DK3_M50
749									DK4	≥150	M25	≤25%	kg	H1_WP_KV_DK4_M25
750											M50	≤50%	kg	H1_WP_KV_DK4_M50
751							KU	Kvadar – velike bale - usitnjena	DK3	≤150	M25	≤25%	kg	H1_WP_KU_DK3_M25
752											M50	≤50%	kg	H1_WP_KU_DK3_M50
753									DK4	≥150	M25	≤25%	kg	H1_WP_KU_DK4_M25
754											M50	≤50%	kg	H1_WP_KU_DK4_M50
755							RM	Rol – male bale	DO1	≤100	M25	≤25%	kg	H1_WP_RM_DO1_M25
756											M50	≤50%	kg	H1_WP_RM_DO1_M50
757									DO2	≥100	M25	≤25%	kg	H1_WP_RM_DO2_M25
758											M50	≤50%	kg	H1_WP_RM_DO2_M50
759							RV	Rol – velike bale	DO1	≤100	M25	≤25%	kg	H1_WP_RV_DO1_M25
760											M50	≤50%	kg	H1_WP_RV_DO1_M50
761									DO2	≥100	M25	≤25%	kg	H1_WP_RV_DO2_M25
762											M50	≤50%	kg	H1_WP_RV_DO2_M50
763							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤90	M25	≤25%	kg	H1_WP_RA_DR1_M25
764											M50	≤50%	kg	H1_WP_RA_DR1_M50
765									DR2	≥90	M25	≤25%	kg	H1_WP_RA_DR2_M25

766											M50	≤50%	kg	H1_WP_RA_DR2_M50
767							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤100	M25	≤25%	kg	H1_WP_RU_DU1_M25
768											M50	≤50%	kg	H1_WP_RU_DU1_M50
769									DU2	≥100	M25	≤25%	kg	H1_WP_RU_DU2_M25
770											M50	≤50%	kg	H1_WP_RU_DU2_M50
771			H2	Drvena biomasa	WP	Cela biljka	PE	Pelete	DP1	≤600	M15	≤15%	kg	H2_WP_PE_DP1_M15
772											M20	≤20%	kg	H2_WP_PE_DP1_M20
773									DP2	≥600	M15	≤15%	kg	H2_WP_PE_DP2_M15
774											M20	≤20%	kg	H2_WP_PE_DP2_M20
775							BR	Briketi	DB1	≤500	M15	≤15%	kg	H2_WP_BR_DB1_M15
776											M20	≤20%	kg	H2_WP_BR_DB1_M20
777									DB2	≥500	M15	≤15%	kg	H2_WP_BR_DB2_M15
778											M20	≤20%	kg	H2_WP_BR_DB2_M20
779							RV	Rol – velike bale	DO1	≤160	M25	≤25%	kg	H2_WP_RV_DO1_M25
780											M50	≤50%	kg	H2_WP_RV_DO1_M50
781									DO2	≥160	M25	≤25%	kg	H2_WP_RV_DO2_M25
782											M50	≤50%	kg	H2_WP_RV_DO2_M50
783							RA	Biomasa u rasutom stanju (rinfuz)	DR1	≤300	M25	≤25%	kg	H2_WP_RA_DR1_M25
784											M50	≤50%	kg	H2_WP_RA_DR1_M50
785									DR2	≥300	M25	≤25%	kg	H2_WP_RA_DR2_M25
786											M50	≤50%	kg	H2_WP_RA_DR2_M50
787							RU	Biomasa u rasutom stanju (rinfuz) - usitnjena	DU1	≤300	M25	≤25%	kg	H2_WP_RU_DU1_M25
788											M50	≤50%	kg	H2_WP_RU_DU1_M50

4.2 Trgovački kodovi za stajnjak

RED. BROJ	KOD	VRSTA BIOMASE	KOD	VRSTA STOKE	KOD	DODACI	KOD	SEPARACIJA	KOD	SADRŽAJ ČVRSTE MATERIJE	JEDINICA MERE	TRGOVAČKI KOD
001	S	Stajnjak	SD	Krave muzare	BP	Bez prostirke	BS	Bez separacije	M5	≤5%	kg	SD_BP_BS_M5
002	S	Stajnjak							M15	≤15%	kg	SD_BP_BS_M15
003	S	Stajnjak							M25	≤25%	kg	SD_BP_BS_M25
004	S	Stajnjak					SS	Sa separacijom	M20	≤20%	kg	SD_BP_SS_M20
005	S	Stajnjak							M40	≤40%	kg	SD_BP_SS_M40
006	S	Stajnjak							M60	≤60%	kg	SD_BP_SS_M60
007	S	Stajnjak			SP	Sa prostirkom	BS	Bez separacije	M40	≤40%	kg	SD_BP_BS_M40
008	S	Stajnjak							M60	≤60%	kg	SD_BP_BS_M60
009	S	Stajnjak							M80	≤80%	kg	SD_BP_BS_M80
010	S	Stajnjak					SS	Sa separacijom	M50	≤50%	kg	SD_BP_SS_M50
011	S	Stajnjak							M70	≤70%	kg	SD_BP_SS_M70
012	S	Stajnjak							M90	≤90%	kg	SD_BP_SS_M90
013	S	Stajnjak	SB	Tovna junad	BP	Bez prostirke	BS	Bez separacije	M5	≤5%	kg	SB_BP_BS_M5
014	S	Stajnjak							M15	≤15%	kg	SB_BP_BS_M15
015	S	Stajnjak							M25	≤25%	kg	SB_BP_BS_M25
016	S	Stajnjak					SS	Sa separacijom	M20	≤20%	kg	SB_BP_SS_M20
017	S	Stajnjak							M40	≤40%	kg	SB_BP_SS_M40
018	S	Stajnjak							M60	≤60%	kg	SB_BP_SS_M60
019	S	Stajnjak			SP	Sa prostirkom	BS	Bez separacije	M40	≤40%	kg	SB_BP_BS_M40
020	S	Stajnjak							M60	≤60%	kg	SB_BP_BS_M60
021	S	Stajnjak							M80	≤80%	kg	SB_BP_BS_M80
022	S	Stajnjak					SS	Sa separacijom	M50	≤50%	kg	SB_BP_SS_M50

023	S	Stajnjak							M70	≤70%	kg	SB_BP_SS_M70
024	S	Stajnjak							M90	≤90%	kg	SB_BP_SS_M90
025	S	Stajnjak	SS	Svinje	BP	Bez prostirke	BS	Bez separacije	M5	≤5%	kg	SS_BP_BS_M5
026	S	Stajnjak							M15	≤15%	kg	SS_BP_BS_M15
027	S	Stajnjak							M25	≤25%	kg	SS_BP_BS_M25
028	S	Stajnjak					SS	Sa separacijom	M20	≤20%	kg	SS_BP_SS_M20
029	S	Stajnjak							M40	≤40%	kg	SS_BP_SS_M40
030	S	Stajnjak							M60	≤60%	kg	SS_BP_SS_M60
031	S	Stajnjak			SP	Sa prostirkom	BS	Bez separacije	M40	≤40%	kg	SS_BP_BS_M40
032	S	Stajnjak							M60	≤60%	kg	SS_BP_BS_M60
033	S	Stajnjak							M80	≤80%	kg	SS_BP_BS_M80
034	S	Stajnjak					SS	Sa separacijom	M50	≤50%	kg	SS_BP_SS_M50
035	S	Stajnjak							M70	≤70%	kg	SS_BP_SS_M70
036	S	Stajnjak							M90	≤90%	kg	SS_BP_SS_M90
037	S	Stajnjak	SP	Perad	BP	Bez prostirke	BS	Bez separacije	M5	≤5%	kg	SP_BP_BS_M5
038	S	Stajnjak							M15	≤15%	kg	SP_BP_BS_M15
039	S	Stajnjak							M25	≤25%	kg	SP_BP_BS_M25
040	S	Stajnjak					SS	Sa separacijom	M20	≤20%	kg	SP_BP_SS_M20
041	S	Stajnjak							M40	≤40%	kg	SP_BP_SS_M40
042	S	Stajnjak							M60	≤60%	kg	SP_BP_SS_M60
043	S	Stajnjak			SP	Sa prostirkom	BS	Bez separacije	M40	≤40%	kg	SP_BP_BS_M40
044	S	Stajnjak							M60	≤60%	kg	SP_BP_BS_M60
045	S	Stajnjak							M80	≤80%	kg	SP_BP_BS_M80
046	S	Stajnjak					SS	Sa separacijom	M50	≤50%	kg	SP_BP_SS_M50
047	S	Stajnjak							M70	≤70%	kg	SP_BP_SS_M70

048	S	Stajnjak							M90	≤90%	kg	SP_BP_SS_M90
049	S	Stajnjak	SH	Konji	BP	Bez prostirke	BS	Bez separacije	M15	≤15%	kg	SH_BP_BS_M15
050	S	Stajnjak							M25	≤25%	kg	SH_BP_BS_M25
051	S	Stajnjak					SS	Sa separacijom	M50	≤50%	kg	SH_BP_SS_M50
052	S	Stajnjak							M80	≤80%	kg	SH_BP_SS_M80
053	S	Stajnjak			SP	Sa prostirkom	BS	Bez separacije	M30	≤30%	kg	SH_BP_BS_M30
054	S	Stajnjak							M50	≤50%	kg	SH_BP_BS_M50
055	S	Stajnjak					SS	Sa separacijom	M70	≤70%	kg	SH_BP_SS_M70
056	S	Stajnjak							M90	≤90%	kg	SH_BP_SS_M90
057	S	Stajnjak	SG	Koze i ovce	BP	Bez prostirke	BS	Bez separacije	M15	≤15%	kg	SG_BP_BS_M15
058	S	Stajnjak							M25	≤25%	kg	SG_BP_BS_M25
059	S	Stajnjak					SS	Sa separacijom	M50	≤50%	kg	SG_BP_SS_M50
060	S	Stajnjak							M80	≤80%	kg	SG_BP_SS_M80
061	S	Stajnjak			SP	Sa prostirkom	BS	Bez separacije	M30	≤30%	kg	SG_BP_BS_M30
062	S	Stajnjak							M50	≤50%	kg	SG_BP_BS_M50
063	S	Stajnjak					SS	Sa separacijom	M70	≤70%	kg	SG_BP_SS_M70
064	S	Stajnjak							M90	≤90%	kg	SG_BP_SS_M90

REFERENCE

- [1] Alimpić M.: Energija iz poljoprivrede, časopis (1983) „Savremena poljoprivredna tehnika“, Vojvođansko društvo za poljoprivrednu tehniku, Novi Sad, 9(1-2), 1-7;
- [2] Brkić M, Janić T. (1998) Mogućnosti korišćenja biomase u poljoprivredi, Zbornik radova sa II savetovanja: „Briketiranje i peletiranje biomase iz poljoprivrede i šumarstva“, Regionalna privredna komora, Sombor, „Dacom“, Apatin, 5-9;
- [3] Brkić M, Janić T, Somer D. (2006). Termotehnika u poljoprivredi – II deo: Procesna tehnika i energetika, Poljoprivredni fakultet, Novi Sad, 323;
- [4] Brkić, M, Potkonjak V, Somer D, Zoranović, M, Đukić, Đ. (1995). Fazni izveštaj po projektu (PR – 262): „Proizvodnja biogasa iz sekundarnih sirovina poljoprivrede i prehrambene industrije- korišćenje biogasa i prevrelog ostatka“, Poljoprivredni fakultet, Novi Sad, 47;
- [5] Brkić, M, Janić, T. (2009). Briketiranje i peletiranje biomase, monografija, Poljoprivredni fakultet, Novi Sad, 253;
- [6] Callé, F. R. (2007) The Biomass Assessment Handbook: Bioenergy for a Sustainable Environment, Earthscan, London, 269;
- [7] Charles Fulhage, John Hoehne (2001) Planning and Evaluation of Manure Storage, University of Missouri, 24;
- [8] Hartmann, H.: Ernte. In: Kaltschmitt, M.; Hartmann, H.; Hofbauer, H. (Hrsg.) (2009) Energie aus Biomasse – Grundlagen, Techniken und Verfahren. 2. Aufl. Heidelberg: Springer, S. 217–244;
- [9] Janić, T. (2000). Kinetika sagorevanja balirane pšenične slame, doktorska disertacija, Poljoprivredni fakultet, Novi Sad, 123;
- [10] Katić Z. (1982). Energetska valjanost poljoprivredne proizvodnje i njena zavisnost sa granicama energetskog obračuna, Zbornik radova: „Aktualni problemi mehanizacije poljoprivrede“, Fakultet poljoprivrednih znanosti, Zagreb;
- [11] Kosi F. (2003) Ostaci biomase u stočarstvu - tečni stajnjak, studija: „Energetski potencijal i karakteristike ostataka biomase i tehnologije za njenu pripremu i energetsko iskorišćenje u Srbiji“, Institut za nuklearne nauke „Vinča“, Beograd, 11-24;
- [12] Kovčin S. (1993) Analiza stanja u oblasti proizvodnje i korišćenja stajnjaka, monografija: „Proizvodnja i korišćenje biogasa iz stajnjaka“, Poljoprivredni fakultet, Novi Sad, 5-11;
- [13] Loo, V. S., Koppejan, J. (2008) Biomass combustion and co-firing, Earthscan, London, 442;
- [14] Martinov M. (1980) Toplotna moć slame žita uzgajanih na području SAP Vojvodine, časopis: „Savremena poljoprivredna tehnika“, VDPT, Novi Sad, 6(3): 95 – 101;
- [15] Mitić D. (1998). Fizičke karakteristike biomasa i biobriketa Srbije (potencijalna ekološka goriva), monografija, JDPTEP, JSDITZ, Novi Sad – Niš, 119;
- [16] Novaković D, Đević M. (2000). Ostaci rezidbe u voćarstvu i vinogradarstvu kao izvor energije, PTEP, JDPTEP, Novi Sad, 4(1-2): 51-53;
- [17] Novaković D, Đević M, Radojević, D. (2003) Ostaci biomase u voćarstvu i vinogradarstvu, studija: „Energetski potencijal i karakteristike ostataka biomase i tehnologije za njenu pripremu i energetsko iskorišćenje u Srbiji, Institut za nuklearne nauke“, Vinča, Beograd, 6-10. 42/73;

[18] Potkonjak V. (2007). Tehnika spremanja biomase, studija NPEE 273022A: „Tehnoekonomska karakterizacija, tipizacija i izbor kapaciteta i postrojenja za korišćenje biomase u sušarama i proizvodnim pogonima ZZ „Bag-Deko“ u Bačkom Gradištu“, Poljoprivredni fakultet, Novi Sad, 146.

[19] Vujić G. i sar. (2009) Utvrđivanje sastava otpada i procene količine u cilju definisanja strategije upravljanja sekundarnim sirovinama u sklopu održivog razvoja Republike Srbije, preliminarni izveštaj po projektu, Departman za inženjerstvo zaštite životne sredine, Fakultet tehničkih nauka, Novi Sad, 99.

AGRICULTURAL BIOMASS PRODUCT CATALOGUE



May, 2016

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1 INTRODUCTION

The key purpose of the Agricultural Biomass Product Catalogue is to provide clear and unambiguous principles for product classification, specification of product dimensions, units of measure in which they are produced and distributed to the market, and other elements relevant for efficient trading and good understanding between sellers and buyers. The Agricultural Biomass Product Catalogue (hereinafter: the Catalogue) is also a good tool for reporting by producers and traders to relevant authorities, chambers, associations and other organizations.

The key **purpose of developing** the Catalogue is to serve as support to:

- Establishment of the market of agricultural biomass as a raw material for energy generation;
- Programmers and other actors involved in the process of establishing the data base for the purpose of trading in these products in the **biomass exchange and**
- **Direct participants in trading in order to better understand the characteristics of products which are traded.**

For this reason every biomass product has been assigned a relevant generic code, including within it a trading code with the key elements enabling clear recognition of products and product characteristics (primarily: class of quality, moisture content, dimensions, and units of measurement).

The definitions of trading codes are based on EN14961-1 standard, along with the use of parameters and values from practice and technical literature.

In order to achieve efficient trading on the biomass exchange and to prevent misunderstanding among trading participants it is recommended that trading participants study well all the elements of this Catalogue.

2 BASIC DIVISION

The basic division used in this Catalogue is the division to agricultural biomass of plant and of animal origin - manure.

2.1 Agricultural biomass of plant origin

The basic division for classification is done on the basis of the standard EN14961-1 (Solid Biofuels - Fuel specifications and classes – Part 1: General requirements), and with respect to the standard EN 14961-1 the Catalogue does not include biomass from vegetables and flowers due to limited quantities and thus lower potential for energy generation from such sources in Serbia.

Mixtures and blends are also not separately treated but it is left to the users to combine trading codes depending on the actual mixture³.

The Table below presents the division into categories and sub-categories with types covered, and sub-categories were developed taking into consideration the manner of growth and characteristics relevant to Serbia which are relevant to the use of biomass for energy generation purposes. Equally, the following Table 1: Categories of agricultural biomass of plant origin also presents an overview of parts of plants used for energy generation for each sub-category.

Table 5: Categories of agricultural biomass of plant origin

SUB-CATEGORY	DESCRIPTION (TYPES COVERED)	PARTS OF THE PLANT MOST FREQUENTLY USED
C – Cereals		
C1	Wheat, oats, barley, rye, rice	Whole plant Parts of plants Grainy residues
C2	Corn	Whole plant Cobs Parts of plants Grainy residues
C3	Millet, sorghum	Whole plant Parts of plants Grainy residues
G – Grass and woody plants (energy plantations)		
G1	Grass – Switchgrass, sweet sorghum	- Whole plant
G2	Reed - Miscanthus	- Whole plant

³ . Blends are intentionally designed mixtures of several types of biomass (possibly of several different granulations) in a definite proportion, while mixture of biomass is organic material just mixed without an intended plan (ex. Residues after utility works, the so-called communal waste etc.).

G3	Woody plants	- Whole plant
O – Oil plants		
O1	Soybean	Whole plant Stalk and leaves Husks and grainy residues
O2	Oil seed rape, flax, castor oil plant	Whole plant Stalk and leaves Husks and grainy residues
O3	Sunflower	Whole plant Stalk and leaves Husks and grainy residues
R – Vegetables and root crops		
R1	Sugar beet and vegetable residues	plant residues
L – legumes		
L1	Beans, broad beans, peas, peanuts, lentils, chickpeas	Whole plant Stalk and leaves
H – Green plants residues from gardens, parks and road maintenance, orchards and vineyards		
H1	Grass	Whole plant
H2	Wood biomass	Whole plant

2.2 Agricultural biomass of animal origin - manure

For the purposes of this Catalogue a basic classification is also provided for key biomass of animal origin – manure. The key parameters for classification of manure are as follows:

- Origin: dairy cows, fattening cattle, pigs, poultry, horses, goats and sheep,
- Whether it has gone through separation or not,
- Whether it is mixed with bedding or not.

A special parameter describing the usability of manure is the share of solid matter in manure which mostly depend on the above three parameters.

The content of dry matter in liquid manure differs depending on the type and category of animals, mostly on type of animals, method of growing and feeding and the season of the year. In handling manure and washing of facilities due to excessive irrational use of water or exposure to precipitation or other sources of water can lead to considerable dilution of liquid manure which in turn considerably changes the ratios.

3 DESCRIPTION OF INDIVIDUAL PARAMETERS OF TRADING CODES

3.1 Parameters for definition of trading codes for agricultural biomass of plant origin

Coding:

Product type_Sub-category_Parts of plants_Form of biomass_Density_Moisture

The code consists of four parameters defined by the origin and type of preparation of biomass (product type, sub-category, parts of plants and form), while density and moisture are the measurable parameters. The unit of measurement used for all product types is kilogram (kg).

The defined parameters are verifiable and as such they facilitate trading and reduce the risk of misunderstanding among actors in the trading process.

The text below shall present the key characteristics of individual parameters.

3.1.1 Product type and sub-categories

As presented in the previous chapter, the division into product types was done on the basis of standard EN 14961-1, noting that with respect to standard EN 14961-1, the review does not include biomass from vegetables and flowers due to their low use for energy generation in Serbia.

The following product types have been defined:

- **Cereals,**
- **Grass and woody plantations (energy plantations),**
- **Oil plants,**
- **Leguminous plant,**
- **Vegetables and root crops,**
- **Residues of leafy plants from gardens, parks and road maintenance, orchards and vineyards.**

Sub-categories include groups of plants defined taking into consideration the method of growing and characteristics relevant to use of biomass for energy generation purposes. Division into product types and sub-categories is presented in Table 2 below:

Table 6: Sub-categories of agricultural biomass of plant origin

PRODUCT TYPE	SUB-CATEGORY
Cereals	C 1: Wheat, oats, barley, rice, rye C2: Corn C3: Millet, sorghum
Grass and woody plantations (energy plantations)	G1: Grass – Switchgrass, sweet sorghum G2: Reed – Miscanthus G3: Woody crops
Oil plants	O1: Soybean O2: Oil seed rape, flax, castor oil plant O3: Sunflower
Leguminosae	L1: Beans, broad beans, peas, peanuts, lentils, chickpeas
Vegetables and root crops	R1: Sugar beet and vegetable residues
- Residues of leafy plants from gardens, parks and road maintenance, orchards and vineyards	H1: Grass H2: Wood biomass

3.1.2 Form of biomass

The Catalogue covers the following forms of biomass:

- **Pellets**

Pellets are of cylindrical form, with typical diameter $\varnothing$ 6 to 12 mm, length usually 4 to 5 times greater than diameter. The surface of pellets is smooth, stable, hard and most often dust free. Pellets density can exceed 650 kg/m^3 . Pellets are available in bulk, packed in bags and big jumbo bags. Handling is done manually or in a mechanized way.

- **Briquettes**

Briquettes can be of cylindrical form, with usual diameter $\varnothing$ 80 to 90 mm, and also in form of cubes of different dimensions, most often $150 \times 70 \times 60 \text{ mm}$. The surface of briquettes is most often not smooth and can be loose. Briquettes density ranges about 600 kg/m^3 (exceptionally also higher). It is available in regular bags, big jumbo bags and containers. Handling is done manually or in a mechanized way.

- **Cubes – small bales**

Small cube bales are formed under increased pressure. Their usual width is up to 0.5 m, height up to 0.4 m, and length about 1 m. Their density is up to 130 kg/m^3 . The mass of bales goes up to 25 kg, thus their dimensions and mass enable all technological operations in their preparations and handling to be performed manually.

- **Cubes – big bales**

Big cubic bales are formed under high pressure. Their usual width is up to 0.8 – 1.2 m, height up to 0.5 – 1.3 m, and length up to 2.8 m. Their density is up to 160 kg/m^3 . The mass of bales goes up to 550 kg. Technological operations in their preparations and handling are performed with the assistance of machinery. At present, major consumers of biomass bales mostly use biomass in this form.

- **Cubes – big bales of fragmented biomass**

Big cubic bales made up of pre-fragmented biomass are formed under highest pressures. Their dimensions most often are the same as for non-fragmented biomass bales, thus width is up to 0.8 – 1.2 m, height up to 0.5 – 1.3 m, and length up to 3 m. their density exceeds 170 kg/m^3 . The mass of bales goes up to 650 kg. Technological operations in their preparations and handling are performed with the assistance of machinery.

- **Rolls – small bales**

Small roll bales are formed under high pressure. Their width is usually 1.2 -1.5 m, diameter up to 0.9 m. Bulk density is up to 120 kg/m^3 . The mass per bale is up to 115 kg. Technological operations in their preparations and handling are performed with the assistance of small machinery.

- **Roll – big bales**

Big roll bales are formed under high pressure. Their width is usually 1.2 -1.5 m, diameter up to 1.8 m. Bulk density is up to 120 kg/m^3 . The mass per bale is up to 400 kg. Technological operations in their preparations and handling are performed with the assistance of machinery.

- **Biomass in loose form**

Density of loose biomass is below 80 kg/m^3 (except for grain residues), most frequently up to 50 kg/m^3 making it not at all fit for handling and transport to bigger distances. In practice it can be found in production plants or stacked. Its additional fragmentation requires additional labour and energy and it is reflected in the price of such biomass.

- **Biomass in loose form, fragmented**

Density of fragmented loose biomass is up to 100 kg/m^3 except for grain residues), most frequently up to 60 kg/m^3 making it not at all fit for handling and transport to bigger distances. In practice it can be found in production plants or stacked. It is practical if it requires internal or short distance transport.

DIMENSIONS OF STRAW BALES

Expected dimensions of fuel biomass in bales are presented in the scheme below (Hartmann, H.: Ernte. In: Kaltschmitt, M.; Hartmann, H.; Hofbauer, H. (Hrsg.) 2009. Energie aus Biomasse – Grundlagen, Techniken und Verfahren. 2. Aufl. Heidelberg: Springer, S. 217–244):

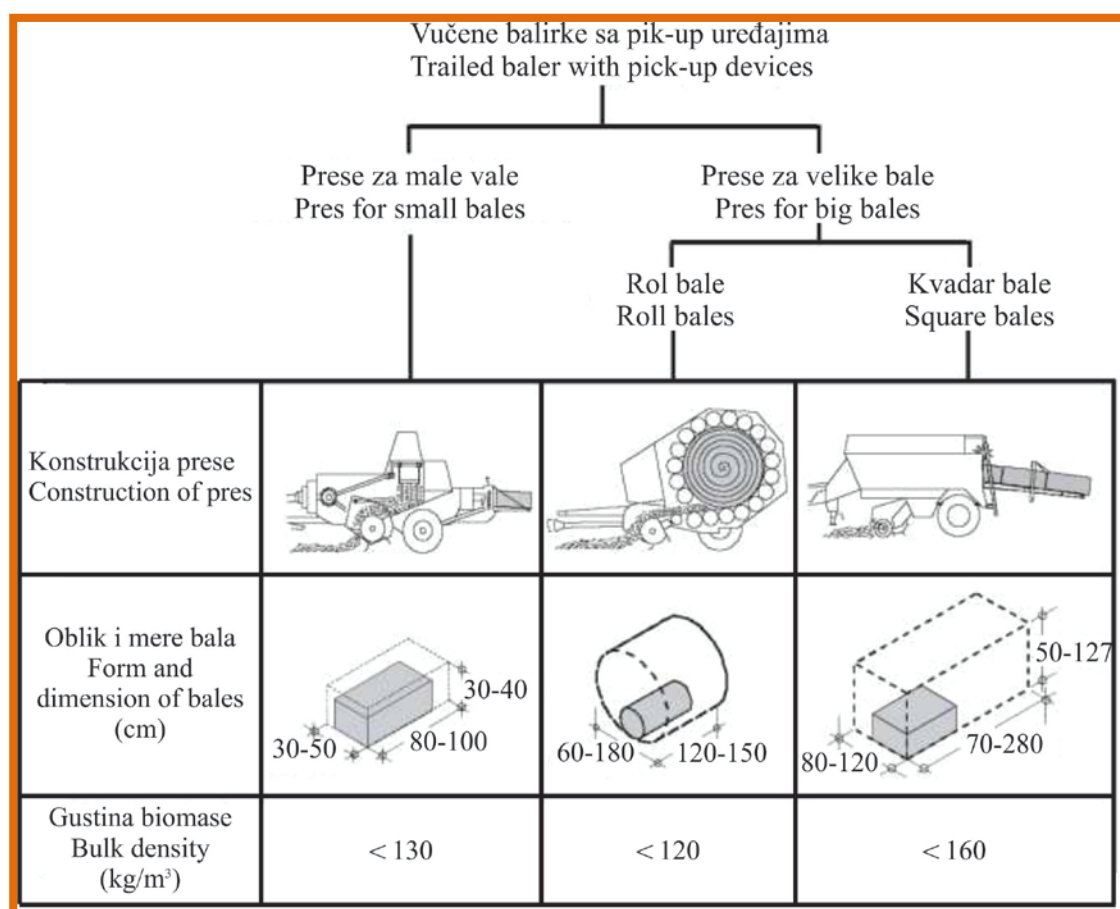


Figure 1. Form and dimensions of biomass bales (Hartmann 2009)

3.1.3 Density of biomass of plant origin

As stated above in the descriptions of forms of biomass, the bulk density depends on the settings of equipment used in its preparation. The table with trading codes presents the values of biomass bulk densities taking into consideration the type of biomass and technical functionalities of preparation equipment (the form) and ranges between 50 kg/m³ (loose biomass) and over 600 kg/m³ for pellets.

3.1.4 Moisture content of biomass of plant origin

Moisture content of biomass depends on the plant species, harvesting time, weather conditions and handling methods (storing after harvest and method of preparation). The table with trading codes presents values of biomass moisture contents depending on plant species, expected harvesting time, method of preparation, and the expected method of use for energy purposes. The presented moisture content ranges from below 15%, which is frequent in biomass resulting from grains and oil plants, to 80% in case of loose biomass resulting from vegetables and root crops.

3.2 Trading codes for manure

As stated in the preceding chapter, the key parameters for classification of manure are as follows:

- Origin: dairy cows, fattening cattle, pigs, poultry, horses, goats and sheep,
- Whether it is mixed with bedding or not.
- Whether it has gone through separation or not,
- Share of solid matter in manure %.

Trading codes are developed using the following method:

Type of biomass and species of animals_Additives_Separation_Share of solid matter

3.3 Overview of abbreviations used for individual parameters relevant to definitions of trading codes

For the purposes of defining trading codes for this Catalogue the following abbreviations are used (based on the elements described above):

VII. Abbreviations for product type

PRODUCT TYPE	ABBREVIATION
Cereals	C
Grass and woody plants (energy plantations)	G
Oil plants	O
Vegetables and root crops	R
Legumes	L
- Residues of leafy plants from gardens, parks and road maintenance, orchards and vineyards	H
Manure	S

VIII. Abbreviations for sub-categories

SUB-CATEGORY	ABBREVIATION
Wheat, oats, barley, rice, rye	C1

Corn	C2
Millet, sorghum	C3
Grass – Switchgrass, sweet sorghum	G1
Reed – Miscanthus	G2
Woody crops	G3
Soybean	O1
Oil seed rape, flax, castor oil plant	O2
Sunflower	O3
Sugar beet and vegetable residues	R1
Beans, broad beans, peas, peanuts, lentils, chickpeas	L1
Grass	H1
Wood biomass	H2
Manure from dairy cows	SD
Manure from fattening cattle	SB
Manure from pigs	SS
Manure from poultry	SP
Manure from horses	SH
Manure from goats and sheep	SG

IX. Abbreviations for parts of plants

PARTS OF PLANTS	ABBREVIATION
Whole plant	WP
Parts of plants (without grains)	SP
Stalk and leaves	SL

Grainy residues	GR
Cobs	OK

X. Abbreviations for form of biomass

NAME OF FORM	ABBREVIATION
Pellets	PE
Briquettes	BR
Cubes – small bales	KM
Cubes – big bales	KV
Cubes – big bales fragmented biomass	KU
Rolls – small bales	RM
Rolls – big bales	RV
Loose biomass	RA
Loose biomass fragmented	RU

XI. Abbreviations denoting presence of bedding in the manure

WITH BEDDING	SP
Without bedding	BP

XII. Abbreviations denoting separation of manure

WITH SEPARATION	SS
Without separation	BS

3.4 Examples of forming the trading codes

On the basis of the above presented elements, the following text gives two examples of forming the trading code for randomly chosen agricultural biomass products, one of plant origin and one of animal origin.

Example 1. A farmer wishes to offer at the biomass exchange 10 t of wheat straw in form of big roll bales. The dimensions of the straw bales are as follows: width 1.2 m and diameter 1.5 m. the average mass of the bales is 250 kg. The measured moisture content of the straw is 20%. Define the trading code by which the farmer can in a very simple and understandable manner offer the product of stated characteristics at the biomass exchange?

Trading codes for the above example includes:

First digit: product type / type of biomass ... cereals, wheat straw (**C1**)
 Second digit: parts of plants stalk with leaves (**SP**)
 Third digit: form of biomass big roll bale (**RV**)
 Fourth digit: bulk density of biomass (**DO2**) (bale density $\geq 100 \text{ kg/m}^3$)
 Fifth digit: moisture content of biomass (**M15**) (moisture content of biomass $\leq 25\%$)

Trading code for example 1 is: **C1_SP_RV_DO2_M15**

Example 2. A dairy cattle farm raising cattle without bedding is selling liquid non-separated manure. The share of solid matter in manure is 15%. Define the trading code by which the farmer can in a very simple and understandable manner offer the product of stated characteristics at the biomass exchange?

Trading codes for the above example includes:

First digit: type of biomass / species of animals farm manure, dairy cows (**SD**)
 Second digit: additives in manure without bedding (**BP**)
 Third digit: has it undergone separationwithout separation (**BS**)
 Fourth digit: share of solid matter (**M15**)

Trading code for example 2 is: **SD_BP_BS_M15**

3.5 Approximate values of calorific value of agricultural biomass

3.5.1 Biomass of plant origin

Since calorific value depends on many factors, the Table 3 below presents some approximate indicative values for certain parts of plants for different crops at moisture content of 14% on the basis of existing technical literature (stated in the list of References):

Table 7: Indicative values of calorific value of certain crops at moisture content of 14%

CROP	PARTS OF PLANTS	INDICATIVE CALORIFIC VALUE
Wheat	Straw	14,00 MJ/kg
Oats	Straw	14,50 MJ/kg

Barley	Straw	14,20 MJ/kg
Rye	Straw	14,00 MJ/kg
Rice	Straw	13,40 MJ/kg
Corn	Whole stalk	13,50 MJ/kg
Corn	Cobs	14,70 MJ/kg
Millet and sorghum	Straw	13,20 MJ/kg
Switchgrass, sweet sorghum	Whole plant	13,90 MJ/kg
Reed - Miscanthus	Whole plant	14,90 MJ/kg
Woody energy crops	Whole plant	15,90 MJ/kg
Soybean	Straw	15,70 MJ/kg
Oil seed rape, flax, castor oil plant	Straw	17,40 MJ/kg
Sunflower	Stalk	14,50 MJ/kg
Sunflower	Husks	17,55 MJ/kg
Beans, broad beans, peas, peanuts, lentils, chickpeas	Stalk	14,40 MJ/kg
Plant residues from gardens, parks, road maintenance, orchards and vineyards	Grass	13,20 MJ/kg
Plant residues from gardens, parks, road maintenance, orchards and vineyards	Wood biomass	15,50 MJ/kg

Since the calorific value of certain types of biomass depends mostly on their chemical composition, there are mathematical formulas for calculation.

Upper calorific value of fuels (hs)

Loo and Koppejan (2008) provide an empirical formula for calculation of the upper calorific value of biomass of plant origin with acceptable accuracy (Loo, V. S., Koppejan, J.: Biomass combustion and co-firing, Earthscan, London, 2008, s. 442):

$$hs = 0,3491 \cdot X_C + 1,1783 \cdot X_H + 0,1005 \cdot X_S - 0,0151 \cdot X_N - 0,1034 \cdot X_O - 0,0211 \cdot X_A \left[\frac{\text{MJ}}{\text{kg}} \right] \quad (1)$$

where:

X_C – percentage share of carbon in the biomass (dry base),

X_H – percentage share of hydrogen in the biomass (dry base),

X_S – percentage share of sulphur in the biomass (dry base),

X_N – percentage share of nitrogen in the biomass (dry base),

X_O – percentage share of oxygen in the biomass (dry base) and

X_A – percentage share of ash in the biomass (dry base).

The **lower calorific value (hd)** denotes the quantity of heat that is released during full combustion, when the resulting water is separated in form of steam. This physical indicator serves the purpose of determining the quantity of actual heat which will be generated per one kilogram of fuel. There is also an empirical formula for the lower calorific value of biomass (Callé, 2007) based on the known upper calorific value (Callé, F. R.: The Biomass Assessment Handbook: Bioenergy for a Sustainable Environment, Earthscan, London, 2007, s. 269):

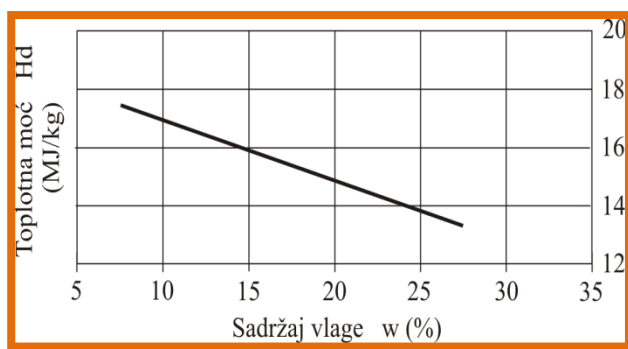
$$hd = hs \cdot \left(1 - \frac{W}{100}\right) - 2,447 \cdot \left(\frac{W}{100}\right) - 2,447 \cdot \left(\frac{H}{100}\right) \cdot 9,01 \cdot \left(1 - \frac{W}{100}\right) \quad (2)$$

where:

W - percentage content of moisture in the biomass and

H – percentage content of hydrogen in the biomass (dry base)

The calorific value changes significantly with the change of moisture content of the fuel, as can be seen in the example of stalk residues below:



3.5.2 Manure

For orientation purposes, Table 4 below presents the expected dry matter content (%) in non-separated manure without bedding depending on its origin (Kovčin S. (1993) Analiza stanja u oblasti proizvodnje i korišćenja stajnjaka, monografija: "Proizvodnja and korišćenje biogasa iz stajnjaka", Poljoprivredni fakultet, Novi Sad, 5-11.):

Table 8: Expected content of dry matter in non-separated manure without bedding depending on its origin (Kovčin, 1993.)

SPECIES OF ANIMALS	EXPECTED SOLID MATTER CONTENT (%) IN NON-SEPARATED MANURE WITHOUT BEDDING
Dairy cows	13
Fattening cattle	11,5
Pigs	10
Poultry	25

4 LIST OF LABORATORIES FOR TESTING OF BIOMASS CHARACTERISTICS

This chapter presents the list of laboratories engaged in testing characteristics of biomass used for fuel purposes.

INSTITUT ZA HEMIJU, TEHNOLOGIJU I METALURGIJU

(INSTITUTE FOR CHEMISTRY, TECHNOLOGY AND METALLURGY)

Laboratorija centra za hemiju

Njegoševa 12, 11000 Beograd

Tel: +381 11 3640 232, Fax: +381113640 234

E-mail: ihtm@ihtm.bg.ac.rs

RUDARSKI INSTITUT D.O.O., Beograd (THE MINING INSTITUTE)

Laboratorija za čvrsta goriva (Laboratory for solid fuels)

Batajnički put 2, Beograd-Zemun

Tel: + 381 11 26 14 323

E-mail: hemija@ribeograd.ac.rs

JUGOINSPEKT BEOGRAD A.D.

Laboratorija za ispitivanje čvrstih mineralnih goriva and mineralnih sirovina (Laboratory for testing of mineral fuels and mineral materials)

Čika Ljubina 8/V, Beograd

Tel: +381 11 2622199, fax: +381 11 2626 349

E-mail: office@jugoinspekt.com

INSTITUT ZA RATARSTVO I POVRTARSTVO (INSTITUTE FOR FIELD CROPS AND VEGETABLES)

Laboratorija za zemljište and agroekologiju (Laboratory for soil and agro-ecology)

Maksima Gorkog 30, 21000 Novi Sad

Tel: +381 21 4898 100 (switch), fax: +381 21 6621 212

E-mail: institut@ifvcns.ns.ac.rs

INSTITUT ZA NUKLEARNE NAUKE „VINČA“ (INSTITUTE FOR NUCLEAR SCIENCES „VINČA“)

Laboratorija za termotehniku and energetiku (LABORATORY FOR THERMOTECHNICS AND ENERGY)

p.fah 522, 11001 Beograd

Tel: +381 11 3408 101 ; +381 11 3408 102

E-mail: office@vin.bg.ac.rs

MAŠINSKI FAKULTET U BEOGRADU (FACULTY OF MECHANICAL ENGINEERING IN BELGRADE)

Laboratorija za goriva and sagorevanje (Laboratory for fuels and combustion)

Kraljice Marije 16, 11120 Beograd, Serbia

Tel: +381 11 3302 200, Fax: +381 11 3370364

E-mail: mf@mas.bg.ac.rs

INSTITUT ZA OPŠTU I FIZIČKU HEMIJU (INSTITUTE FOR GENERAL AND PHYSICAL CHEMISTRY)

Laboratorija za ispitivanje, istraživanje and razvoj (laboratory for testing, research and development)

Studentski trg 12-16, 11000 Beograd,

Tel: +381 11 186 742, 637-569, Fax: +381 11 180 329

E-mail: bsimonovic@iofh.bg.ac.yu

SGS BEOGRAD

Jurija Gagarina 7b, 11070 Beograd, Srbija

Tel: + 381 11 71 55 275, fax: + 381 11 22 84 241

E-mail: sgs.beograd@sgs.com

MAŠINSKI FAKULTET U NIŠU (FACULTY OF MECHANICAL ENGINEERING IN NIŠ)

Laboratorija za goriva and maziva (Laboratory for fuels and lubricants)

Aleksandra Medvedeva 14, 18000 Niš, Srbija

Tel: + 381 18 500 671

E-mail: goca@masfak.ni.ac.yu

NAUČNI INSTITUT ZA PREHRAMBENE TEHNOLOGIJE U NOVOM SADU

Laboratorija za tehnologiju, kvalitet and bezbednost hrane

SCIENTIFIC INSTITUTE FOR FOOD TECHNOLOGY IN NOVI SAD

Laboratory for technology, quality and food safety

Cara Lazara br.1, 21000 Novi Sad, Srbija

Tel: +38121 485 3810

E-mail: zdenka.markovic@fins.uns.ac.rs

SZU BALKAN BEOGRAD

Hemijska laboratorija (Chemical laboratory)

Predstavništvo u Beogradu

Tel: +420 541 120 441

E-mail: watson@szutest.cz

VICTORIA OIL A.D.

Branka Erića 2, 22240 Šid, Srbija

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5 TRADING CODES FOR BIOMASS PRODUCT TYPES

5.1 Trading codes for agricultural biomass of plant origin

ITEM NR.	CODE	PRODUCT TYPE	CODE	SUB-CATEGORY (PLANT SPECIES)	CODE	PARTS OF PLANTS	CODE	FORM OF BIOMASS	CODE	DENSITY (KG/M ³)	CODE	MOISTURE	UNIT OF MEASURE	TRADING CODE
001	C	Cereals	C1	Wheat Oats Barley Rye, Rice	WP	Whole plant	PE	Pellets	DP1	≤600	M15	≤15%	Kg	C1_WP_PE_DP1_M15
002											M20	≤20%	Kg	C1_WP_PE_DP1_M20
003									DP2	≥600	M15	≤15%	Kg	C1_WP_PE_DP2_M15
004											M20	≤20%	Kg	C1_WP_PE_DP2_M20
005							BR	Briquettes	DB1	≤500	M15	≤15%	Kg	C1_WP_BR_DB1_M15
006											M20	≤20%	Kg	C1_WP_BR_DB1_M20
007									DB2	≥500	M15	≤15%	Kg	C1_WP_BR_DB2_M15
008											M20	≤20%	Kg	C1_WP_BR_DB2_M20
009							KM	Cubes – small bales	DK1	≤100	M25	≤25%	Kg	C1_WP_KM_DK1_M25
010											M50	≤50%	Kg	C1_WP_KM_DK1_M50
011									DK2	≥100	M25	≤25%	Kg	C1_WP_KM_DK2_M25
012											M50	≤50%	Kg	C1_WP_KM_DK2_M50
013							KV	Cubes – big bales	DK3	≤150	M25	≤25%	Kg	C1_WP_KV_DK3_M25
014											M50	≤50%	Kg	C1_WP_KV_DK3_M50
015									DK4	≥150	M25	≤25%	Kg	C1_WP_KV_DK4_M25

016											M50	≤50%	kg	C1_WP_KV_DK4_M50
017							KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	C1_WP_KU_DK3_M25
018											M50	≤50%	kg	C1_WP_KU_DK3_M50
019									DK4	≥150	M25	≤25%	kg	C1_WP_KU_DK4_M25
020											M50	≤50%	kg	C1_WP_KU_DK4_M50
021							RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	C1_WP_RM_DO1_M25
022											M50	≤50%	kg	C1_WP_RM_DO1_M50
023									DO2	≥100	M25	≤25%	kg	C1_WP_RM_DO2_M25
024											M50	≤50%	kg	C1_WP_RM_DO2_M50
025							RV	Rolls – big bales	DO1	≤100	M25	≤25%	kg	C1_WP_RV_DO1_M25
026											M50	≤50%	kg	C1_WP_RV_DO1_M50
027									DO2	≥100	M25	≤25%	kg	C1_WP_RV_DO2_M25
028											M50	≤50%	kg	C1_WP_RV_DO2_M50
029							RA	Loose biomass	DR1	≤90	M25	≤25%	kg	C1_WP_RA_DR1_M25
030											M50	≤50%	kg	C1_WP_RA_DR1_M50
031									DR2	≥90	M25	≤25%	kg	C1_WP_RA_DR2_M25
032											M50	≤50%	kg	C1_WP_RA_DR2_M50
033							RU	Loose biomass - fragmented	DU1	≤100	M25	≤25%	kg	C1_WP_RU_DU1_M25
034											M50	≤50%	kg	C1_WP_RU_DU1_M50
035									DU2	≥100	M25	≤25%	kg	C1_WP_RU_DU2_M25
036											M50	≤50%	kg	C1_WP_RU_DU2_M50
037					SP	Stalks and	PE	Pellets	DP1	≤600	M15	≤15%	kg	C1_SP_PE_DP1_M15

						leaves								
038											M20	≤20%	kg	C1_SP_PE_DP1_M20
039									DP2	≥600	M15	≤15%	kg	C1_SP_PE_DP2_M15
040											M20	≤20%	kg	C1_SP_PE_DP2_M20
031							BR	Briquettes	DB1	≤500	M15	≤15%	kg	C1_SP_BR_DB1_M15
032											M20	≤20%	kg	C1_SP_BR_DB1_M20
033									DB2	≥500	M15	≤15%	kg	C1_SP_BR_DB2_M15
034											M20	≤20%	kg	C1_SP_BR_DB2_M20
035							KM	Cubes – small bales	DK1	≤100	M25	≤25%	kg	C1_SP_KM_DK1_M25
036											M50	≤50%	kg	C1_SP_KM_DK1_M50
037									DK2	≥100	M25	≤25%	kg	C1_SP_KM_DK2_M25
038											M50	≤50%	kg	C1_SP_KM_DK2_M50
039							KV	Cubes – big bales	DK3	≤150	M25	≤25%	kg	C1_SP_KV_DK3_M25
040											M50	≤50%	kg	C1_SP_KV_DK3_M50
041									DK4	≥150	M25	≤25%	kg	C1_SP_KV_DK4_M25
042											M50	≤50%	kg	C1_SP_KV_DK4_M50
043							KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	C1_SP_KU_DK3_M25
044											M50	≤50%	kg	C1_SP_KU_DK3_M50
045									DK4	≥150	M25	≤25%	kg	C1_SP_KU_DK4_M25
046											M50	≤50%	kg	C1_SP_KU_DK4_M50
047							RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	C1_SP_RM_DO1_M25

048											M50	≤50%	kg	C1_SP_RM_DO1_M50
049								DO2	≥100		M25	≤25%	kg	C1_SP_RM_DO2_M25
050											M50	≤50%	kg	C1_SP_RM_DO2_M50
051						RV	Rolls – big bales	DO1	≤100		M25	≤25%	kg	C1_SP_RV_DO1_M25
052											M50	≤50%	kg	C1_SP_RV_DO1_M50
053								DO2	≥100		M25	≤25%	kg	C1_SP_RV_DO2_M25
054											M50	≤50%	kg	C1_SP_RV_DO2_M50
055						RA	Loose biomass	DR1	≤90		M25	≤25%	kg	C1_SP_RA_DR1_M25
056											M50	≤50%	kg	C1_WP_RA_DR1_M50
057								DR2	≥90		M25	≤25%	kg	C1_WP_RA_DR2_M25
058											M50	≤50%	kg	C1_WP_RA_DR2_M50
059						RU	Loose biomass - fragmented	DU1	≤100		M25	≤25%	kg	C1_WP_RU_DU1_M25
060											M50	≤50%	kg	C1_SP_RU_DU1_M50
061								DU2	≥100		M25	≤25%	kg	C1_SP_RU_DU2_M25
062											M50	≤50%	kg	C1_SP_RU_DU2_M50
063					GR	Grainy residues	PE	Pellets	DP1	≤600	M15	≤15%	kg	C1_GR_PE_DP1_M15
064											M20	≤20%	kg	C1_GR_PE_DP1_M20
065								DP2	≥600		M15	≤15%	kg	C1_GR_PE_DP2_M15
066											M20	≤20%	kg	C1_GR_PE_DP2_M20
067						BR	Briquettes	DB1	≤500		M15	≤15%	kg	C1_GR_BR_DB1_M15
068											M25	≤20%	kg	C1_GR_BR_DB1_M20
069								DB2	≥500		M15	≤15%	kg	C1_GR_BR_DB2_M15
070											M25	≤20%	kg	C1_GR_BR_DB2_M20

071							RA	Loose biomass	DR1	≤400	M15	≤15%	kg	C1_GR_RA_DR1_M15
072											M25	≤25%	kg	C1_GR_RA_DR1_M25
073											M35	≤35%	kg	C1_GR_RA_DR1_M35
074									DR2	≥400	M15	≤15%	kg	C1_GR_RA_DR2_M15
075											M25	≤25%	kg	C1_GR_RA_DR2_M25
076											M35	≤35%	kg	C1_GR_RA_DR2_M35
077							RU	Loose biomass - fragmented	DU1	≤300	M15	≤15%	kg	C1_GR_RU_DU1_M15
078											M25	≤25%	kg	C1_GR_RU_DU1_M25
079											M35	≤35%	kg	C1_GR_RU_DU1_M35
080									DU2	≥300	M15	≤15%	kg	C1_GR_RU_DU2_M15
081											M25	≤25%	kg	C1_GR_RU_DU2_M25
082											M35	≤35%	kg	C1_GR_RU_DU2_M35
083			C2	Corn	WP	Whole plant	PE	Pellets	DP1	≤600	M15	≤15%	kg	C2_WP_PE_DP1_M15
084											M20	≤20%	kg	C2_WP_PE_DP1_M20
085									DP2	≥600	M15	≤15%	kg	C2_WP_PE_DP2_M15
086											M20	≤20%	kg	C2_WP_PE_DP2_M20
087							BR	Briquettes	DB1	≤500	M15	≤15%	kg	C2_WP_BR_DB1_M15
088											M20	≤20%	kg	C2_WP_BR_DB1_M20
089									DB2	≥500	M15	≤15%	kg	C2_WP_BR_DB2_M15
090											M20	≤20%	kg	C2_WP_BR_DB2_M20
091							KM	Cubes – small bales	DK1	≤100	M25	≤25%	kg	C2_WP_KM_DK1_M25
092											M50	≤50%	kg	C2_WP_KM_DK1_M50
093									DK2	≥100	M25	≤25%	kg	C2_WP_KM_DK2_M25

094											M50	≤50%	kg	C2_WP_KM_DK2_M50
095							KV	Cubes – big bales	DK3	≤150	M25	≤25%	kg	C2_WP_KV_DK3_M25
096											M50	≤50%	kg	C2_WP_KV_DK3_M50
097									DK4	≥150	M25	≤25%	kg	C2_WP_KV_DK4_M25
098											M50	≤50%	kg	C2_WP_KV_DK4_M50
099							KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	C2_WP_KU_DK3_M25
100											M50	≤50%	kg	C2_WP_KU_DK3_M50
101									DK4	≥150	M25	≤25%	kg	C2_WP_KU_DK4_M25
102											M50	≤50%	kg	C2_WP_KU_DK4_M50
103							RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	C2_WP_RM_DO1_M25
104											M50	≤50%	kg	C2_WP_RM_DO1_M50
105									DO2	≥100	M25	≤25%	kg	C2_WP_RM_DO2_M25
106											M50	≤50%	kg	C2_WP_RM_DO2_M50
107							RV	Rolls – big bales	DO1	≤100	M25	≤25%	kg	C2_WP_RV_DO1_M25
108											M50	≤50%	kg	C2_WP_RV_DO1_M50
109									DO2	≥100	M25	≤25%	kg	C2_WP_RV_DO2_M25
110											M50	≤50%	kg	C2_WP_RV_DO2_M50
111							RA	Loose biomass	DR1	≤90	M25	≤25%	kg	C2_WP_RA_DR1_M25
112											M50	≤50%	kg	C2_WP_RA_DR1_M50
113									DR2	≥90	M25	≤25%	kg	C2_WP_RA_DR2_M25
114											M50	≤50%	kg	C2_WP_RA_DR2_M50
115							RU	Loose biomass -	DU1	≤100	M25	≤25%	kg	C2_WP_RU_DU1_M25

								fragmented						
116											M50	≤50%	kg	C2_WP_RU_DU1_M50
117									DU2	≥100	M25	≤25%	kg	C2_WP_RU_DU2_M25
118											M50	≤50%	kg	C2_WP_RU_DU2_M50
119					OK	Cobs	PE	Pellets	DP1	≤600	M15	≤15%	kg	C2_OK_PE_DP1_M15
120											M20	≤20%	kg	C2_OK_PE_DP1_M20
121									DP2	≥600	M15	≤15%	kg	C2_OK_PE_DP2_M15
122											M20	≤20%	kg	C2_OK_PE_DP2_M20
123							BR	Briquettes	DB1	≤500	M15	≤15%	kg	C2_OK_BR_DB1_M15
124											M20	≤20%	kg	C2_OK_BR_DB1_M20
125									DB2	≥500	M15	≤15%	kg	C2_OK_BR_DB2_M15
126											M20	≤20%	kg	C2_OK_BR_DB2_M20
127							RA	Loose biomass	DR1	≤90	M25	≤25%	kg	C2_OK_RA_DR1_M25
128											M50	≤50%	kg	C2_OK_RA_DR1_M50
129									DR2	≥90	M25	≤25%	kg	C2_OK_RA_DR2_M25
130											M50	≤50%	kg	C2_OK_RA_DR2_M50
131							RU	Loose biomass - fragmented	DU1	≤100	M25	≤25%	kg	C2_OK_RU_DU1_M25
132											M50	≤50%	kg	C2_OK_RU_DU1_M50
133									DU2	≥100	M25	≤25%	kg	C2_OK_RU_DU2_M25
134											M50	≤50%	kg	C2_OK_RU_DU2_M50
135					SP	Stalks and leaves	PE	Pellets	DP1	≤600	M15	≤15%	kg	C2_SP_PE_DP1_M15
136											M20	≤20%	kg	C2_SP_PE_DP1_M20
137									DP2	≥600	M15	≤15%	kg	C2_SP_PE_DP2_M15

138											M20	≤20%	kg	C2_SP_PE_DP2_M20
139							BR	Briquettes	DB1	≤500	M15	≤15%	kg	C21_SP_BR_DB1_M15
140											M20	≤20%	kg	C2_SP_BR_DB1_M20
141									DB2	≥500	M15	≤15%	kg	C2_SP_BR_DB2_M15
142											M20	≤20%	kg	C2_SP_BR_DB2_M20
143							KM	Cubes – small bales	DK1	≤100	M25	≤25%	kg	C2_SP_KM_DK1_M25
144											M50	≤50%	kg	C2_SP_KM_DK1_M50
145									DK2	≥100	M25	≤25%	kg	C2_SP_KM_DK2_M25
146											M50	≤50%	kg	C2_SP_KM_DK2_M50
147							KV	Cubes – big bales	DK3	≤150	M25	≤25%	kg	C2_SP_KV_DK3_M25
148											M50	≤50%	kg	C2_SP_KV_DK3_M50
149									DK4	≥150	M25	≤25%	kg	C2_SP_KV_DK4_M25
150											M50	≤50%	kg	C2_SP_KV_DK4_M50
151							KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	C2_SP_KU_DK3_M25
152											M50	≤50%	kg	C2_SP_KU_DK3_M50
153									DK4	≥150	M25	≤25%	kg	C2_SP_KU_DK4_M25
154											M50	≤50%	kg	C2_SP_KU_DK4_M50
155							RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	C2_SP_RM_DO1_M25
156											M50	≤50%	kg	C2_SP_RM_DO1_M50
157									DO2	≥100	M25	≤25%	kg	C2_SP_RM_DO2_M25
158											M50	≤50%	kg	C2_SP_RM_DO2_M50

159							RV	Rolls – big bales	DO1	≤100	M25	≤25%	kg	C2_SP_RV_DO1_M25
160											M50	≤50%	kg	C2_SP_RV_DO1_M50
161									DO2	≥100	M25	≤25%	kg	C2_SP_RV_DO2_M25
162											M50	≤50%	kg	C2_SP_RV_DO2_M50
163							RA	Loose biomass	DR1	≤90	M25	≤25%	kg	C2_SP_RA_DR1_M25
164											M50	≤50%	kg	C2_WP_RA_DR1_M50
165									DR2	≥90	M25	≤25%	kg	C2_WP_RA_DR2_M25
166											M50	≤50%	kg	C2_WP_RA_DR2_M50
167							RU	Loose biomass - fragmented	DU1	≤100	M25	≤25%	kg	C2_WP_RU_DU1_M25
168											M50	≤50%	kg	C2_SP_RU_DU1_M50
169									DU2	≥100	M25	≤25%	kg	C2_SP_RU_DU2_M25
170											M50	≤50%	kg	C2_SP_RU_DU2_M50
171					GR	Grainy residues	PE	Pellets	DP1	≤600	M15	≤15%	kg	C2_GR_PE_DP1_M15
172											M20	≤20%	kg	C2_GR_PE_DP1_M20
173									DP2	≥600	M15	≤15%	kg	C2_GR_PE_DP2_M15
174											M20	≤20%	kg	C2_GR_PE_DP2_M20
175							BR	Briquettes	DB1	≤500	M15	≤15%	kg	C2_GR_BR_DB1_M15
176											M25	≤20%	kg	C2_GR_BR_DB1_M20
177									DB2	≥500	M15	≤15%	kg	C2_GR_BR_DB2_M15
178											M25	≤20%	kg	C2_GR_BR_DB2_M20
179							RA	Loose biomass	DR1	≤400	M15	≤15%	kg	C2_GR_RA_DR1_M15
180											M25	≤25%	kg	C2_GR_RA_DR1_M25
181											M35	≤35%	kg	C2_GR_RA_DR1_M35

182									DR2	≥400	M15	≤15%	kg	C2_GR_RA_DR2_M15
183											M25	≤25%	kg	C2_GR_RA_DR2_M25
184											M35	≤35%	kg	C2_GR_RA_DR2_M35
185							RU	Loose biomass - fragmented	DU1	≤300	M15	≤15%	kg	C2_GR_RU_DU1_M15
186											M25	≤25%	kg	C2_GR_RU_DU1_M25
187											M35	≤35%	kg	C2_GR_RU_DU1_M35
188									DU2	≥300	M15	≤15%	kg	C2_GR_RU_DU2_M15
189											M25	≤25%	kg	C2_GR_RU_DU2_M25
190											M35	≤35%	kg	C2_GR_RU_DU2_M35
191			C3	Millet, Sorghum	WP	Whole plant	PE	Pellets	DP1	≤600	M15	≤15%	kg	C3_WP_PE_DP1_M15
192											M20	≤20%	kg	C3_WP_PE_DP1_M20
193									DP2	≥600	M15	≤15%	kg	C3_WP_PE_DP2_M15
194											M20	≤20%	kg	C3_WP_PE_DP2_M20
195							BR	Briquettes	DB1	≤500	M15	≤15%	kg	C3_WP_BR_DB1_M15
196											M20	≤20%	kg	C3_WP_BR_DB1_M20
197									DB2	≥500	M15	≤15%	kg	C3_WP_BR_DB2_M15
198											M20	≤20%	kg	C3_WP_BR_DB2_M20
199							KM	Cubes – small bales	DK1	≤100	M25	≤25%	kg	C3_WP_KM_DK1_M25
200											M50	≤50%	kg	C3_WP_KM_DK1_M50
201									DK2	≥100	M25	≤25%	kg	C3_WP_KM_DK2_M25
202											M50	≤50%	kg	C3_WP_KM_DK2_M50
203							KV	Cubes – big	DK3	≤150	M25	≤25%	kg	C3_WP_KV_DK3_M25

								bales						
204											M50	≤50%	kg	C3_WP_KV_DK3_M50
205									DK4	≥150	M25	≤25%	kg	C3_WP_KV_DK4_M25
206											M50	≤50%	kg	C3_WP_KV_DK4_M50
207							KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	C3_WP_KU_DK3_M25
208											M50	≤50%	kg	C3_WP_KU_DK3_M50
209									DK4	≥150	M25	≤25%	kg	C3_WP_KU_DK4_M25
210											M50	≤50%	kg	C3_WP_KU_DK4_M50
211							RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	C3_WP_RM_DO1_M25
212											M50	≤50%	kg	C3_WP_RM_DO1_M50
213									DO2	≥100	M25	≤25%	kg	C3_WP_RM_DO2_M25
214											M50	≤50%	kg	C3_WP_RM_DO2_M50
215							RV	Rolls – big bales	DO1	≤100	M25	≤25%	kg	C3_WP_RV_DO1_M25
216											M50	≤50%	kg	C3_WP_RV_DO1_M50
217									DO2	≥100	M25	≤25%	kg	C3_WP_RV_DO2_M25
218											M50	≤50%	kg	C3_WP_RV_DO2_M50
219							RA	Loose biomass	DR1	≤90	M25	≤25%	kg	C3_WP_RA_DR1_M25
220											M50	≤50%	kg	C3_WP_RA_DR1_M50
221									DR2	≥90	M25	≤25%	kg	C3_WP_RA_DR2_M25
222											M50	≤50%	kg	C3_WP_RA_DR2_M50
223							RU	Loose biomass - fragmented	DU1	≤100	M25	≤25%	kg	C3_WP_RU_DU1_M25
224											M50	≤50%	kg	C3_WP_RU_DU1_M50

225									DU2	≥100	M25	≤25%	kg	C3_WP_RU_DU2_M25
226											M50	≤50%	kg	C3_WP_RU_DU2_M50
227					SP	Stalks and leaves	PE	Pellets	DP1	≤600	M15	≤15%	kg	C3_SP_PE_DP1_M15
228											M20	≤20%	kg	C3_SP_PE_DP1_M20
229									DP2	≥600	M15	≤15%	kg	C3_SP_PE_DP2_M15
230											M20	≤20%	kg	C3_SP_PE_DP2_M20
231							BR	Briquettes	DB1	≤500	M15	≤15%	kg	C3_SP_BR_DB1_M15
232											M20	≤20%	kg	C3_SP_BR_DB1_M20
233									DB2	≥500	M15	≤15%	kg	C3_SP_BR_DB2_M15
234											M20	≤20%	kg	C3_SP_BR_DB2_M20
235							KM	Cubes – small bales	DK1	≤100	M25	≤25%	kg	C3_SP_KM_DK1_M25
236											M50	≤50%	kg	C3_SP_KM_DK1_M50
237									DK2	≥100	M25	≤25%	kg	C3_SP_KM_DK2_M25
238											M50	≤50%	kg	C3_SP_KM_DK2_M50
239							KV	Cubes – big bales	DK3	≤150	M25	≤25%	kg	C3_SP_KV_DK3_M25
240											M50	≤50%	kg	C3_SP_KV_DK3_M50
241									DK4	≥150	M25	≤25%	kg	C3_SP_KV_DK4_M25
242											M50	≤50%	kg	C3_SP_KV_DK4_M50
243							KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	C3_SP_KU_DK3_M25
244											M50	≤50%	kg	C3_SP_KU_DK3_M50
245									DK4	≥150	M25	≤25%	kg	C3_SP_KU_DK4_M25

246											M50	≤50%	kg	C3_SP_KU_DK4_M50
247							RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	C3_SP_RM_DO1_M25
248											M50	≤50%	kg	C3_SP_RM_DO1_M50
249									DO2	≥100	M25	≤25%	kg	C3_SP_RM_DO2_M25
250											M50	≤50%	kg	C3_SP_RM_DO2_M50
251							RV	Rolls – big bales	DO1	≤100	M25	≤25%	kg	C3_SP_RV_DO1_M25
252											M50	≤50%	kg	C3_SP_RV_DO1_M50
253									DO2	≥100	M25	≤25%	kg	C3_SP_RV_DO2_M25
254											M50	≤50%	kg	C3_SP_RV_DO2_M50
255							RA	Loose biomass	DR1	≤90	M25	≤25%	kg	C3_SP_RA_DR1_M25
256											M50	≤50%	kg	C3_WP_RA_DR1_M50
257									DR2	≥90	M25	≤25%	kg	C3_WP_RA_DR2_M25
258											M50	≤50%	kg	C3_WP_RA_DR2_M50
259							RU	Loose biomass - fragmented	DU1	≤100	M25	≤25%	kg	C3_WP_RU_DU1_M25
260											M50	≤50%	kg	C3_SP_RU_DU1_M50
261									DU2	≥100	M25	≤25%	kg	C3_SP_RU_DU2_M25
262											M50	≤50%	kg	C3_SP_RU_DU2_M50
263					GR	Grainy residues	PE	Pellets	DP1	≤600	M15	≤15%	kg	C3_GR_PE_DP1_M15
264											M20	≤20%	kg	C3_GR_PE_DP1_M20
265									DP2	≥600	M15	≤15%	kg	C3_GR_PE_DP2_M15
266											M20	≤20%	kg	C3_GR_PE_DP2_M20
267							BR	Briquettes	DB1	≤500	M15	≤15%	kg	C3_GR_BR_DB1_M15

268											M25	≤20%	kg	C3_GR_BR_DB1_M20
269									DB2	≥500	M15	≤15%	kg	C3_GR_BR_DB2_M15
270											M25	≤20%	kg	C3_GR_BR_DB2_M20
271							RA	Loose biomass	DR1	≤400	M15	≤15%	kg	C3_GR_RA_DR1_M15
272											M25	≤25%	kg	C3_GR_RA_DR1_M25
273											M35	≤35%	kg	C3_GR_RA_DR1_M35
274									DR2	≥400	M15	≤15%	kg	C3_GR_RA_DR2_M15
275											M25	≤25%	kg	C3_GR_RA_DR2_M25
276											M35	≤35%	kg	C3_GR_RA_DR2_M35
277							RU	Loose biomass - fragmented	DU1	≤300	M15	≤15%	kg	C3_GR_RU_DU1_M15
278											M25	≤25%	kg	C3_GR_RU_DU1_M25
279											M35	≤35%	kg	C3_GR_RU_DU1_M35
280									DU2	≥300	M15	≤15%	kg	C3_GR_RU_DU2_M15
281											M25	≤25%	kg	C3_GR_RU_DU2_M25
282											M35	≤35%	kg	C3_GR_RU_DU2_M35
283	G	Grass and woody plants	G1	Switchgrass	WP	Whole plants	PE	Pellets	DP1	≤600	M15	≤15%	kg	G1_WP_PE_DP1_M15
284											M20	≤20%	kg	G1_WP_PE_DP1_M20
285									DP2	≥600	M15	≤15%	kg	G1_WP_PE_DP2_M15
286											M20	≤20%	kg	G1_WP_PE_DP2_M20
287							BR	Briquettes	DB1	≤500	M15	≤15%	kg	G1_WP_BR_DB1_M15
288											M20	≤20%	kg	G1_WP_BR_DB1_M20
289									DB2	≥500	M15	≤15%	kg	G1_WP_BR_DB2_M15
290											M20	≤20%	kg	G1_WP_BR_DB2_M20

291						KM	Cubes – small bales	DK1	≤100	M25	≤25%	kg	G1_WP_KM_DK1_M25
292										M50	≤50%	kg	G1_WP_KM_DK1_M50
293								DK2	≥100	M25	≤25%	kg	G1_WP_KM_DK2_M25
294										M50	≤50%	kg	G1_WP_KM_DK2_M50
295						KV	Cubes – big bales	DK3	≤150	M25	≤25%	kg	G1_WP_KV_DK3_M25
296										M50	≤50%	kg	G1_WP_KV_DK3_M50
297								DK4	≥150	M25	≤25%	kg	G1_WP_KV_DK4_M25
298										M50	≤50%	kg	G1_WP_KV_DK4_M50
299						KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	G1_WP_KU_DK3_M25
300										M50	≤50%	kg	G1_WP_KU_DK3_M50
301								DK4	≥150	M25	≤25%	kg	G1_WP_KU_DK4_M25
302										M50	≤50%	kg	G1_WP_KU_DK4_M50
303						RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	G1_WP_RM_DO1_M25
304										M50	≤50%	kg	G1_WP_RM_DO1_M50
305								DO2	≥100	M25	≤25%	kg	G1_WP_RM_DO2_M25
306										M50	≤50%	kg	G1_WP_RM_DO2_M50
307						RV	Rolls – big bales	DO1	≤100	M25	≤25%	kg	G1_WP_RV_DO1_M25
308										M50	≤50%	kg	G1_WP_RV_DO1_M50
309								DO2	≥100	M25	≤25%	kg	G1_WP_RV_DO2_M25
310										M50	≤50%	kg	G1_WP_RV_DO2_M50
311						RA	Loose biomass	DR1	≤90	M25	≤25%	kg	G1_WP_RA_DR1_M25

312											M50	≤50%	kg	G1_WP_RA_DR1_M50
313									DR2	≥90	M25	≤25%	kg	G1_WP_RA_DR2_M25
314											M50	≤50%	kg	G1_WP_RA_DR2_M50
315							RU	Loose biomass - fragmented	DU1	≤100	M25	≤25%	kg	G1_WP_RU_DU1_M25
316											M50	≤50%	kg	G1_WP_RU_DU1_M50
317									DU2	≥100	M25	≤25%	kg	G1_WP_RU_DU2_M25
318											M50	≤50%	kg	G1_WP_RU_DU2_M50
319			G2	Mischanthus	WP	Whole plants	PE	Pellets	DP1	≤600	M15	≤15%	kg	G2_WP_PE_DP1_M15
320											M20	≤20%	kg	G2_WP_PE_DP1_M20
321									DP2	≥600	M15	≤15%	kg	G2_WP_PE_DP2_M15
322											M20	≤20%	kg	G2_WP_PE_DP2_M20
323							BR	Briquettes	DB1	≤500	M15	≤15%	kg	G2_WP_BR_DB1_M15
324											M20	≤20%	kg	G2_WP_BR_DB1_M20
325									DB2	≥500	M15	≤15%	kg	G2_WP_BR_DB2_M15
326											M20	≤20%	kg	G2_WP_BR_DB2_M20
327							KM	Cubes – small bales	DK1	≤100	M25	≤25%	kg	G2_WP_KM_DK1_M25
328											M50	≤50%	kg	G2_WP_KM_DK1_M50
329									DK2	≥100	M25	≤25%	kg	G2_WP_KM_DK2_M25
330											M50	≤50%	kg	G2_WP_KM_DK2_M50
331							KV	Cubes – big bales	DK3	≤150	M25	≤25%	kg	G2_WP_KV_DK3_M25
332											M50	≤50%	kg	G2_WP_KV_DK3_M50
333									DK4	≥150	M25	≤25%	kg	G2_WP_KV_DK4_M25

334											M50	≤50%	kg	G2_WP_KV_DK4_M50
335							KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	G2_WP_KU_DK3_M25
336											M50	≤50%	kg	G2_WP_KU_DK3_M50
337									DK4	≥150	M25	≤25%	kg	G2_WP_KU_DK4_M25
338											M50	≤50%	kg	G2_WP_KU_DK4_M50
339							RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	G2_WP_RM_DO1_M25
340											M50	≤50%	kg	G2_WP_RM_DO1_M50
341									DO2	≥100	M25	≤25%	kg	G2_WP_RM_DO2_M25
342											M50	≤50%	kg	G2_WP_RM_DO2_M50
343							RV	Rolls – big bales	DO1	≤100	M25	≤25%	kg	G2_WP_RV_DO1_M25
344											M50	≤50%	kg	G2_WP_RV_DO1_M50
345									DO2	≥100	M25	≤25%	kg	G2_WP_RV_DO2_M25
346											M50	≤50%	kg	G2_WP_RV_DO2_M50
347							RA	Loose biomass	DR1	≤90	M25	≤25%	kg	G2_WP_RA_DR1_M25
348											M50	≤50%	kg	G2_WP_RA_DR1_M50
349									DR2	≥90	M25	≤25%	kg	G2_WP_RA_DR2_M25
350											M50	≤50%	kg	G2_WP_RA_DR2_M50
351							RU	Loose biomass - fragmented	DU1	≤100	M25	≤25%	kg	G2_WP_RU_DU1_M25
352											M50	≤50%	kg	G2_WP_RU_DU1_M50
353									DU2	≥100	M25	≤25%	kg	G2_WP_RU_DU2_M25
354											M50	≤50%	kg	G2_WP_RU_DU2_M50
355			G3	Woody plants	WP	Whole plant	PE	Pellets	DP1	≤600	M15	≤15%	kg	G2_WP_PE_DP1_M15

356											M20	≤20%	kg	G2_WP_PE_DP1_M20
357									DP2	≥600	M15	≤15%	kg	G2_WP_PE_DP2_M15
358											M20	≤20%	kg	G2_WP_PE_DP2_M20
359							BR	Briquettes	DB1	≤500	M15	≤15%	kg	G2_WP_BR_DB1_M15
360											M20	≤20%	kg	G2_WP_BR_DB1_M20
361									DB2	≥500	M15	≤15%	kg	G2_WP_BR_DB2_M15
362											M20	≤20%	kg	G2_WP_BR_DB2_M20
363							RV	Rolls – big bales	DO1	≤160	M25	≤25%	kg	G2_WP_RV_DO1_M25
364											M50	≤50%	kg	G2_WP_RV_DO1_M50
365									DO2	≥160	M25	≤25%	kg	G2_WP_RV_DO2_M25
366											M50	≤50%	kg	G2_WP_RV_DO2_M50
367							RA	Loose biomass	DR1	≤300	M25	≤25%	kg	G2_WP_RA_DR1_M25
368											M50	≤50%	kg	G2_WP_RA_DR1_M50
369									DR2	≥300	M25	≤25%	kg	G2_WP_RA_DR2_M25
370											M50	≤50%	kg	G2_WP_RA_DR2_M50
371							RU	Loose biomass - fragmented	DU1	≤300	M25	≤25%	kg	G2_WP_RU_DU1_M25
372											M50	≤50%	kg	G2_WP_RU_DU1_M50
373									DU2	≥300	M25	≤25%	kg	G2_WP_RU_DU2_M25
374											M50	≤50%	kg	G2_WP_RU_DU2_M50
375	O	Oil plants	O1	Soybean	WP	Whole plant	PE	Pellets	DP1	≤600	M15	≤15%	kg	O1_WP_PE_DP1_M15
376											M20	≤20%	kg	O1_WP_PE_DP1_M20
377									DP2	≥600	M15	≤15%	kg	O1_WP_PE_DP2_M15
378											M20	≤20%	kg	O1_WP_PE_DP2_M20

379						BR	Briquettes	DB1	≤500	M15	≤15%	kg	O1_WP_BR_DB1_M15
380										M20	≤20%	kg	O1_WP_BR_DB1_M20
381								DB2	≥500	M15	≤15%	kg	O1_WP_BR_DB2_M15
382										M20	≤20%	kg	O1_WP_BR_DB2_M20
383						KM	Cubes – small bales	DK1	≤100	M25	≤25%	kg	O1_WP_KM_DK1_M25
384										M50	≤50%	kg	O1_WP_KM_DK1_M50
385								DK2	≥100	M25	≤25%	kg	O1_WP_KM_DK2_M25
386										M50	≤50%	kg	O1_WP_KM_DK2_M50
387						KV	Cubes – big bales	DK3	≤150	M25	≤25%	kg	O1_WP_KV_DK3_M25
388										M50	≤50%	kg	O1_WP_KV_DK3_M50
389								DK4	≥150	M25	≤25%	kg	O1_WP_KV_DK4_M25
390										M50	≤50%	kg	O1_WP_KV_DK4_M50
391						KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	O1_WP_KU_DK3_M25
392										M50	≤50%	kg	O1_WP_KU_DK3_M50
393								DK4	≥150	M25	≤25%	kg	O1_WP_KU_DK4_M25
394										M50	≤50%	kg	O1_WP_KU_DK4_M50
395						RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	O1_WP_RM_DO1_M25
396										M50	≤50%	kg	O1_WP_RM_DO1_M50
397								DO2	≥100	M25	≤25%	kg	O1_WP_RM_DO2_M25
398										M50	≤50%	kg	O1_WP_RM_DO2_M50
399						RV	Rolls – big bales	DO1	≤100	M25	≤25%	kg	O1_WP_RV_DO1_M25

400											M50	≤50%	kg	O1_WP_RV_DO1_M50
401								DO2	≥100		M25	≤25%	kg	O1_WP_RV_DO2_M25
402											M50	≤50%	kg	O1_WP_RV_DO2_M50
403						RA	Loose biomass	DR1	≤90		M25	≤25%	kg	O1_WP_RA_DR1_M25
404											M50	≤50%	kg	O1_WP_RA_DR1_M50
405								DR2	≥90		M25	≤25%	kg	O1_WP_RA_DR2_M25
406											M50	≤50%	kg	O1_WP_RA_DR2_M50
407						RU	Loose biomass - fragmented	DU1	≤100		M25	≤25%	kg	O1_WP_RU_DU1_M25
408											M50	≤50%	kg	O1_WP_RU_DU1_M50
409								DU2	≥100		M25	≤25%	kg	O1_WP_RU_DU2_M25
410											M50	≤50%	kg	O1_WP_RU_DU2_M50
411					SL	Stalk and leaves	PE	Pellets	DP1	≤600	M15	≤15%	kg	O1_SL_PE_DP1_M15
412											M20	≤20%	kg	O1_SL_PE_DP1_M20
413								DP2	≥600		M15	≤15%	kg	O1_SL_PE_DP2_M15
414											M20	≤20%	kg	O1_SL_PE_DP2_M20
415						BR	Briquettes	DB1	≤500		M15	≤15%	kg	O1_SL_BR_DB1_M15
416											M20	≤20%	kg	O1_SL_BR_DB1_M20
417								DB2	≥500		M15	≤15%	kg	O1_SL_BR_DB2_M15
418											M20	≤20%	kg	O1_SL_BR_DB2_M20
419						KM	Cubes – small bales	DK1	≤100		M25	≤25%	kg	O1_SL_KM_DK1_M25
420											M50	≤50%	kg	O1_SL_KM_DK1_M50
421								DK2	≥100		M25	≤25%	kg	O1_SL_KM_DK2_M25

422											M50	≤50%	kg	O1_SL_KM_DK2_M50
423							KV	Cubes – big bales	DK3	≤150	M25	≤25%	kg	O1_SL_KV_DK3_M25
424											M50	≤50%	kg	O1_SL_KV_DK3_M50
425									DK4	≥150	M25	≤25%	kg	O1_SL_KV_DK4_M25
426											M50	≤50%	kg	O1_SL_KV_DK4_M50
427							KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	O1_SL_KU_DK3_M25
428											M50	≤50%	kg	O1_SL_KU_DK3_M50
429									DK4	≥150	M25	≤25%	kg	O1_SL_KU_DK4_M25
430											M50	≤50%	kg	O1_SL_KU_DK4_M50
431							RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	O1_SL_RM_DO1_M25
432											M50	≤50%	kg	O1_SL_RM_DO1_M50
433									DO2	≥100	M25	≤25%	kg	O1_SL_RM_DO2_M25
434											M50	≤50%	kg	O1_SL_RM_DO2_M50
435							RV	Rolls – big bales	DO1	≤100	M25	≤25%	kg	O1_SL_RV_DO1_M25
436											M50	≤50%	kg	O1_SL_RV_DO1_M50
437									DO2	≥100	M25	≤25%	kg	O1_SL_RV_DO2_M25
438											M50	≤50%	kg	O1_SL_RV_DO2_M50
439							RA	Loose biomass	DR1	≤90	M25	≤25%	kg	O1_SL_RA_DR1_M25
440											M50	≤50%	kg	O1_SL_RA_DR1_M50
441									DR2	≥90	M25	≤25%	kg	O1_SL_RA_DR2_M25
442											M50	≤50%	kg	O1_SL_RA_DR2_M50
443							RU	Loose biomass -	DU1	≤100	M25	≤25%	kg	O1_SL_RU_DU1_M25

								fragmented						
444											M50	≤50%	kg	O1_SL_RU_DU1_M50
445									DU2	≥100	M25	≤25%	kg	O1_SL_RU_DU2_M25
446											M50	≤50%	kg	O1_SL_RU_DU2_M50
447					SH	Husks and grainy residues	PE	Pellets	DP1	≤600	M15	≤15%	kg	O1_SH_PE_DP1_M15
448											M20	≤20%	kg	O1_SH_PE_DP1_M20
449									DP2	≥600	M15	≤15%	kg	O1_SH_PE_DP2_M15
450											M20	≤20%	kg	O1_SH_PE_DP2_M20
451							BR	Briquettes	DB1	≤500	M15	≤15%	kg	O1_SH_BR_DB1_M15
452											M25	≤25%	kg	O1_SH_BR_DB1_M25
453									DB2	≥500	M15	≤15%	kg	O1_SH_BR_DB2_M15
454											M25	≤25%	kg	O1_SH_BR_DB2_M25
455							RA	Loose biomass	DR1	≤400	M15	≤15%	kg	O1_SH_RA_DR1_M15
456											M25	≤25%	kg	O1_SH_RA_DR1_M25
457											M35	≤35%	kg	O1_SH_RA_DR1_M35
458									DR2	≥400	M15	≤15%	kg	O1_SH_RA_DR2_M15
459											M25	≤25%	kg	O1_SH_RA_DR2_M25
460											M35	≤35%	kg	O1_SH_RA_DR2_M35
461							RU	Loose biomass - fragmented	DU1	≤300	M15	≤15%	kg	O1_SH_RU_DU1_M15
462											M25	≤25%	kg	O1_SH_RU_DU1_M25
463											M35	≤35%	kg	O1_SH_RU_DU1_M35
464									DU2	≥300	M15	≤15%	kg	O1_SH_RU_DU2_M15

465											M25	≤25%	kg	O1_SH_RU_DU2_M25
466											M35	≤35%	kg	O1_SH_RU_DU2_M35
467			O2	Oil seed rape, Flax, Castor oil plant	WP	Whole plant	PE	Pellets	DP1	≤600	M15	≤15%	kg	O2_WP_PE_DP1_M15
468											M20	≤20%	kg	O2_WP_PE_DP1_M20
469									DP2	≥600	M15	≤15%	kg	O2_WP_PE_DP2_M15
470											M20	≤20%	kg	O2_WP_PE_DP2_M20
471							BR	Briquettes	DB1	≤500	M15	≤15%	kg	O2_WP_BR_DB1_M15
472											M20	≤20%	kg	O2_WP_BR_DB1_M20
473									DB2	≥500	M15	≤15%	kg	O2_WP_BR_DB2_M15
474											M20	≤20%	kg	O2_WP_BR_DB2_M20
475							KM	Cubes – small bales	DK1	≤100	M25	≤25%	kg	O2_WP_KM_DK1_M25
476											M50	≤50%	kg	O2_WP_KM_DK1_M50
477									DK2	≥100	M25	≤25%	kg	O2_WP_KM_DK2_M25
478											M50	≤50%	kg	O2_WP_KM_DK2_M50
479							KV	Cubes – big bales	DK3	≤150	M25	≤25%	kg	O2_WP_KV_DK3_M25
480											M50	≤50%	kg	O2_WP_KV_DK3_M50
481									DK4	≥150	M25	≤25%	kg	O2_WP_KV_DK4_M25
482											M50	≤50%	kg	O2_WP_KV_DK4_M50
483							KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	O2_WP_KU_DK3_M25
484											M50	≤50%	kg	O2_WP_KU_DK3_M50

485									DK4	≥150	M25	≤25%	kg	O2_WP_KU_DK4_M25
486											M50	≤50%	kg	O2_WP_KU_DK4_M50
487							RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	O2_WP_RM_DO1_M25
488											M50	≤50%	kg	O2_WP_RM_DO1_M50
489									DO2	≥100	M25	≤25%	kg	O2_WP_RM_DO2_M25
490											M50	≤50%	kg	O2_WP_RM_DO2_M50
491							RV	Rolls – big bales	DO1	≤100	M25	≤25%	kg	O2_WP_RV_DO1_M25
492											M50	≤50%	kg	O2_WP_RV_DO1_M50
493									DO2	≥100	M25	≤25%	kg	O2_WP_RV_DO2_M25
494											M50	≤50%	kg	O2_WP_RV_DO2_M50
495							RA	Loose biomass	DR1	≤90	M25	≤25%	kg	O2_WP_RA_DR1_M25
496											M50	≤50%	kg	O2_WP_RA_DR1_M50
497									DR2	≥90	M25	≤25%	kg	O2_WP_RA_DR2_M25
498											M50	≤50%	kg	O2_WP_RA_DR2_M50
499							RU	Loose biomass - fragmented	DU1	≤100	M25	≤25%	kg	O2_WP_RU_DU1_M25
500											M50	≤50%	kg	O2_WP_RU_DU1_M50
501									DU2	≥100	M25	≤25%	kg	O2_WP_RU_DU2_M25
502											M50	≤50%	kg	O2_WP_RU_DU2_M50
503					SL	Stalk and leaves	PE	Pellets	DP1	≤600	M15	≤15%	kg	O2_SL_PE_DP1_M15
504											M20	≤20%	kg	O2_SL_PE_DP1_M20
505									DP2	≥600	M15	≤15%	kg	O2_SL_PE_DP2_M15
506											M20	≤20%	kg	O2_SL_PE_DP2_M20

507						BR	Briquettes	DB1	≤500	M15	≤15%	kg	O2_SL_BR_DB1_M15
508										M20	≤20%	kg	O2_SL_BR_DB1_M20
509								DB2	≥500	M15	≤15%	kg	O2_SL_BR_DB2_M15
510										M20	≤20%	kg	O2_SL_BR_DB2_M20
511						KM	Cubes – small bales	DK1	≤100	M25	≤25%	kg	O2_SL_KM_DK1_M25
512										M50	≤50%	kg	O2_SL_KM_DK1_M50
513								DK2	≥100	M25	≤25%	kg	O2_SL_KM_DK2_M25
514										M50	≤50%	kg	O2_SL_KM_DK2_M50
515						KV	Cubes – big bales	DK3	≤150	M25	≤25%	kg	O2_SL_KV_DK3_M25
516										M50	≤50%	kg	O2_SL_KV_DK3_M50
517								DK4	≥150	M25	≤25%	kg	O2_SL_KV_DK4_M25
518										M50	≤50%	kg	O2_SL_KV_DK4_M50
519						KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	O2_SL_KU_DK3_M25
520										M50	≤50%	kg	O2_SL_KU_DK3_M50
521								DK4	≥150	M25	≤25%	kg	O2_SL_KU_DK4_M25
522										M50	≤50%	kg	O2_SL_KU_DK4_M50
523						RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	O2_SL_RM_DO1_M25
524										M50	≤50%	kg	O2_SL_RM_DO1_M50
525								DO2	≥100	M25	≤25%	kg	O2_SL_RM_DO2_M25
526										M50	≤50%	kg	O2_SL_RM_DO2_M50
527						RV	Rolls – big bales	DO1	≤100	M25	≤25%	kg	O2_SL_RV_DO1_M25

528											M50	≤50%	kg	O2_SL_RV_DO1_M50
529									DO2	≥100	M25	≤25%	kg	O2_SL_RV_DO2_M25
530											M50	≤50%	kg	O2_SL_RV_DO2_M50
531							RA	Loose biomass	DR1	≤90	M25	≤25%	kg	O2_SL_RA_DR1_M25
532											M50	≤50%	kg	O2_SL_RA_DR1_M50
533									DR2	≥90	M25	≤25%	kg	O2_SL_RA_DR2_M25
534											M50	≤50%	kg	O2_SL_RA_DR2_M50
535							RU	Loose biomass - fragmented	DU1	≤100	M25	≤25%	kg	O2_SL_RU_DU1_M25
536											M50	≤50%	kg	O2_SL_RU_DU1_M50
537									DU2	≥100	M25	≤25%	kg	O2_SL_RU_DU2_M25
538											M50	≤50%	kg	O2_SL_RU_DU2_M50
539					SH	Husks and grainy residues	PE	Pellets	DP1	≤600	M15	≤15%	kg	O2_SH_PE_DP1_M15
540											M20	≤20%	kg	O2_SH_PE_DP1_M20
541									DP2	≥600	M15	≤15%	kg	O2_SH_PE_DP2_M15
542											M20	≤20%	kg	O2_SH_PE_DP2_M20
543							BR	Briquettes	DB1	≤500	M15	≤15%	kg	O2_SH_BR_DB1_M15
544											M25	≤25%	kg	O2_SH_BR_DB1_M25
545									DB2	≥500	M15	≤15%	kg	O2_SH_BR_DB2_M15
546											M25	≤25%	kg	O2_SH_BR_DB2_M25
547							RA	Loose biomass	DR1	≤400	M15	≤15%	kg	O2_SH_RA_DR1_M15
548											M25	≤25%	kg	O2_SH_RA_DR1_M25
549											M35	≤35%	kg	O2_SH_RA_DR1_M35

550									DR2	≥400	M15	≤15%	kg	O2_SH_RA_DR2_M15
551											M25	≤25%	kg	O2_SH_RA_DR2_M25
552											M35	≤35%	kg	O2_SH_RA_DR2_M35
553							RU	Loose biomass - fragmented	DU1	≤300	M15	≤15%	kg	O2_SH_RU_DU1_M15
554											M25	≤25%	kg	O2_SH_RU_DU1_M25
555											M35	≤35%	kg	O2_SH_RU_DU1_M35
556									DU2	≥300	M15	≤15%	kg	O2_SH_RU_DU2_M15
557											M25	≤25%	kg	O2_SH_RU_DU2_M25
558											M35	≤35%	kg	O2_SH_RU_DU2_M35
559			O3	Sunflower	WP	Whole plant	PE	Pellets	DP1	≤600	M15	≤15%	kg	O3_WP_PE_DP1_M15
560											M20	≤20%	kg	O3_WP_PE_DP1_M20
561									DP2	≥600	M15	≤15%	kg	O3_WP_PE_DP2_M15
562											M20	≤20%	kg	O3_WP_PE_DP2_M20
563							BR	Briquettes	DB1	≤500	M15	≤15%	kg	O3_WP_BR_DB1_M15
564											M20	≤20%	kg	O3_WP_BR_DB1_M20
565									DB2	≥500	M15	≤15%	kg	O3_WP_BR_DB2_M15
566											M20	≤20%	kg	O3_WP_BR_DB2_M20
567							KM	Cubes – small bales	DK1	≤100	M25	≤25%	kg	O3_WP_KM_DK1_M25
568											M50	≤50%	kg	O3_WP_KM_DK1_M50
569									DK2	≥100	M25	≤25%	kg	O3_WP_KM_DK2_M25
570											M50	≤50%	kg	O3_WP_KM_DK2_M50
571							KV	Cubes – big bales	DK3	≤150	M25	≤25%	kg	O3_WP_KV_DK3_M25

572											M50	≤50%	kg	O3_WP_KV_DK3_M50
573									DK4	≥150	M25	≤25%	kg	O3_WP_KV_DK4_M25
574											M50	≤50%	kg	O3_WP_KV_DK4_M50
575							KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	O3_WP_KU_DK3_M25
576											M50	≤50%	kg	O3_WP_KU_DK3_M50
577									DK4	≥150	M25	≤25%	kg	O3_WP_KU_DK4_M25
578											M50	≤50%	kg	O3_WP_KU_DK4_M50
579							RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	O3_WP_RM_DO1_M25
580											M50	≤50%	kg	O3_WP_RM_DO1_M50
581									DO2	≥100	M25	≤25%	kg	O3_WP_RM_DO2_M25
582											M50	≤50%	kg	O3_WP_RM_DO2_M50
583							RV	Rolls – big bales	DO1	≤100	M25	≤25%	kg	O3_WP_RV_DO1_M25
584											M50	≤50%	kg	O3_WP_RV_DO1_M50
585									DO2	≥100	M25	≤25%	kg	O3_WP_RV_DO2_M25
586											M50	≤50%	kg	O3_WP_RV_DO2_M50
587							RA	Loose biomass	DR1	≤90	M25	≤25%	kg	O3_WP_RA_DR1_M25
588											M50	≤50%	kg	O3_WP_RA_DR1_M50
589									DR2	≥90	M25	≤25%	kg	O3_WP_RA_DR2_M25
590											M50	≤50%	kg	O3_WP_RA_DR2_M50
591							RU	Loose biomass - fragmented	DU1	≤100	M25	≤25%	kg	O3_WP_RU_DU1_M25
592											M50	≤50%	kg	O3_WP_RU_DU1_M50
593									DU2	≥100	M25	≤25%	kg	O3_WP_RU_DU2_M25

594											M50	≤50%	kg	O3_WP_RU_DU2_M50
595					SL	Stalk and leaves	PE	Pellets	DP1	≤600	M15	≤15%	kg	O3_SL_PE_DP1_M15
596											M20	≤20%	kg	O3_SL_PE_DP1_M20
597									DP2	≥600	M15	≤15%	kg	O3_SL_PE_DP2_M15
598											M20	≤20%	kg	O3_SL_PE_DP2_M20
599							BR	Briquettes	DB1	≤500	M15	≤15%	kg	O3_SL_BR_DB1_M15
600											M20	≤20%	kg	O3_SL_BR_DB1_M20
601									DB2	≥500	M15	≤15%	kg	O3_SL_BR_DB2_M15
602											M20	≤20%	kg	O3_SL_BR_DB2_M20
603							KM	Cubes – small bales	DK1	≤100	M25	≤25%	kg	O3_SL_KM_DK1_M25
604											M50	≤50%	kg	O3_SL_KM_DK1_M50
605									DK2	≥100	M25	≤25%	kg	O3_SL_KM_DK2_M25
606											M50	≤50%	kg	O3_SL_KM_DK2_M50
607							KV	Cubes – big bales	DK3	≤150	M25	≤25%	kg	O3_SL_KV_DK3_M25
608											M50	≤50%	kg	O3_SL_KV_DK3_M50
609									DK4	≥150	M25	≤25%	kg	O3_SL_KV_DK4_M25
610											M50	≤50%	kg	O3_SL_KV_DK4_M50
611							KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	O3_SL_KU_DK3_M25
612											M50	≤50%	kg	O3_SL_KU_DK3_M50
613									DK4	≥150	M25	≤25%	kg	O3_SL_KU_DK4_M25
614											M50	≤50%	kg	O3_SL_KU_DK4_M50

615							RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	O3_SL_RM_DO1_M25
616											M50	≤50%	kg	O3_SL_RM_DO1_M50
617									DO2	≥100	M25	≤25%	kg	O3_SL_RM_DO2_M25
618											M50	≤50%	kg	O3_SL_RM_DO2_M50
619							RV	Rolls – big bales	DO1	≤100	M25	≤25%	kg	O3_SL_RV_DO1_M25
620											M50	≤50%	kg	O3_SL_RV_DO1_M50
621									DO2	≥100	M25	≤25%	kg	O3_SL_RV_DO2_M25
622											M50	≤50%	kg	O3_SL_RV_DO2_M50
623							RA	Loose biomass	DR1	≤90	M25	≤25%	kg	O3_SL_RA_DR1_M25
624											M50	≤50%	kg	O3_SL_RA_DR1_M50
625									DR2	≥90	M25	≤25%	kg	O3_SL_RA_DR2_M25
626											M50	≤50%	kg	O3_SL_RA_DR2_M50
627							RU	Loose biomass - fragmented	DU1	≤100	M25	≤25%	kg	O3_SL_RU_DU1_M25
628											M50	≤50%	kg	O3_SL_RU_DU1_M50
629									DU2	≥100	M25	≤25%	kg	O3_SL_RU_DU2_M25
630											M50	≤50%	kg	O3_SL_RU_DU2_M50
631					SH	Husks and grainy residues	PE	Pellets	DP1	≤600	M15	≤15%	kg	O3_SH_PE_DP1_M15
632											M20	≤20%	kg	O3_SH_PE_DP1_M20
633									DP2	≥600	M15	≤15%	kg	O3_SH_PE_DP2_M15
634											M20	≤20%	kg	O3_SH_PE_DP2_M20
635							BR	Briquettes	DB1	≤500	M15	≤15%	kg	O3_SH_BR_DB1_M15
636											M25	≤25%	kg	O3_SH_BR_DB1_M25

637									DB2	≥500	M15	≤15%	kg	O3_SH_BR_DB2_M15
638											M25	≤25%	kg	O3_SH_BR_DB2_M25
639							RA	Loose biomass	DR1	≤400	M15	≤15%	kg	O3_SH_RA_DR1_M15
640											M25	≤25%	kg	O3_SH_RA_DR1_M25
641											M35	≤35%	kg	O3_SH_RA_DR1_M35
642									DR2	≥400	M15	≤15%	kg	O3_SH_RA_DR2_M15
643											M25	≤25%	kg	O3_SH_RA_DR2_M25
644											M35	≤35%	kg	O3_SH_RA_DR2_M35
645							RU	Loose biomass - fragmented	DU1	≤300	M15	≤15%	kg	O3_SH_RU_DU1_M15
646											M25	≤25%	kg	O3_SH_RU_DU1_M25
647											M35	≤35%	kg	O3_SH_RU_DU1_M35
648									DU2	≥300	M15	≤15%	kg	O3_SH_RU_DU2_M15
649											M25	≤25%	kg	O3_SH_RU_DU2_M25
650											M35	≤35%	kg	R1_SH_RU_DU2_M35
651	R	Vegetables and root vegetables	R1	Sugar beet, Vegetable residues	RP	Plant residues	RA	Loose biomass	-	-	M25	≤25%	kg	R1_WP_RA_M25
652									-	-	M50	≤50%	kg	R1_WP_RA_M50
653									-	-	M80	≤80%	kg	R1_WP_RA_M80
654									-	-	M25	≤25%	kg	R1_WP_RA_M25
655									-	-	M50	≤50%	kg	R1_WP_RA_M50
656									-	-	M80	≤80%	kg	R1_WP_RA_M80
657							RU	Loose biomass - fragmented	-	-	M25	≤25%	kg	R1_WP_RU_M25
658									-	-	M50	≤50%	kg	R1_WP_RU_M50

659									-	-	M80	≤80%	kg	R1_WP_RA_M80
660									-	-	M25	≤25%	kg	R1_WP_RU_M25
661									-	-	M50	≤50%	kg	R1_WP_RU_M50
662									-		M80	≤80%	kg	R1_WP_RA_M80
663	L	Legumes	L1	Beans, broad beans, peas, peanuts, chickpeas, lentils	WP	Whole plant	PE	Pellets	DP1	≤600	M15	≤15%	kg	L1_WP_PE_DP1_M15
664											M20	≤20%	kg	L1_WP_PE_DP1_M20
665									DP2	≥600	M15	≤15%	kg	L1_WP_PE_DP2_M15
666											M20	≤20%	kg	L1_WP_PE_DP2_M20
667							BR	Briquettes	DB1	≤500	M15	≤15%	kg	L1_WP_BR_DB1_M15
668											M20	≤20%	kg	L1_WP_BR_DB1_M20
669									DB2	≥500	M15	≤15%	kg	L1_WP_BR_DB2_M15
670											M20	≤20%	kg	L1_WP_BR_DB2_M20
671							KM	Cubes – small bales	DK1	≤100	M25	≤25%	kg	L1_WP_KM_DK1_M25
672											M50	≤50%	kg	L1_WP_KM_DK1_M50
673									DK2	≥100	M25	≤25%	kg	L1_WP_KM_DK2_M25
674											M50	≤50%	kg	L1_WP_KM_DK2_M50
675							KV	Cubes – big bales	DK3	≤150	M25	≤25%	kg	L1_WP_KV_DK3_M25
676											M50	≤50%	kg	L1_WP_KV_DK3_M50
677									DK4	≥150	M25	≤25%	kg	L1_WP_KV_DK4_M25
678											M50	≤50%	kg	L1_WP_KV_DK4_M50
679							KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	L1_WP_KU_DK3_M25

680											M50	≤50%	kg	L1_WP_KU_DK3_M50
681									DK4	≥150	M25	≤25%	kg	L1_WP_KU_DK4_M25
682											M50	≤50%	kg	L1_WP_KU_DK4_M50
683							RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	L1_WP_RM_DO1_M25
684											M50	≤50%	kg	L1_WP_RM_DO1_M50
685									DO2	≥100	M25	≤25%	kg	L1_WP_RM_DO2_M25
686											M50	≤50%	kg	L1_WP_RM_DO2_M50
687							RV	Rolls – big bales	DO1	≤100	M25	≤25%	kg	L1_WP_RV_DO1_M25
688											M50	≤50%	kg	L1_WP_RV_DO1_M50
689									DO2	≥100	M25	≤25%	kg	L1_WP_RV_DO2_M25
690											M50	≤50%	kg	L1_WP_RV_DO2_M50
691							RA	Loose biomass	DR1	≤90	M25	≤25%	kg	L1_WP_RA_DR1_M25
692											M50	≤50%	kg	L1_WP_RA_DR1_M50
693									DR2	≥90	M25	≤25%	kg	L1_WP_RA_DR2_M25
694											M50	≤50%	kg	L1_WP_RA_DR2_M50
695							RU	Loose biomass - fragmented	DU1	≤100	M25	≤25%	kg	L1_WP_RU_DU1_M25
696											M50	≤50%	kg	L1_WP_RU_DU1_M50
697									DU2	≥100	M25	≤25%	kg	L1_WP_RU_DU2_M25
698											M50	≤50%	kg	L1_WP_RU_DU2_M50
699					SL	Stalk and leaves	PE	Pellets	DP1	≤600	M15	≤15%	kg	L1_SL_PE_DP1_M15
700											M20	≤20%	kg	L1_SL_PE_DP1_M20
701									DP2	≥600	M15	≤15%	kg	L1_SL_PE_DP2_M15

702											M20	≤20%	kg	L1_SL_PE_DP2_M20
703							BR	Briquettes	DB1	≤500	M15	≤15%	kg	L1_SL_BR_DB1_M15
704											M20	≤20%	kg	L1_SL_BR_DB1_M20
705									DB2	≥500	M15	≤15%	kg	L1_SL_BR_DB2_M15
706											M20	≤20%	kg	L1_SL_BR_DB2_M20
707							KM	Cubes – small bales	DK1	≤100	M25	≤25%	kg	L1_SL_KM_DK1_M25
708											M50	≤50%	kg	L1_SL_KM_DK1_M50
709									DK2	≥100	M25	≤25%	kg	L1_SL_KM_DK2_M25
710											M50	≤50%	kg	L1_SL_KM_DK2_M50
711							KV	Cubes – big bales	DK3	≤150	M25	≤25%	kg	L1_SL_KV_DK3_M25
712											M50	≤50%	kg	L1_SL_KV_DK3_M50
713									DK4	≥150	M25	≤25%	kg	L1_SL_KV_DK4_M25
714											M50	≤50%	kg	L1_SL_KV_DK4_M50
715							KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	L1_SL_KU_DK3_M25
716											M50	≤50%	kg	L1_SL_KU_DK3_M50
717									DK4	≥150	M25	≤25%	kg	L1_SL_KU_DK4_M25
718											M50	≤50%	kg	L1_SL_KU_DK4_M50
719							RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	L1_SL_RM_DO1_M25
720											M50	≤50%	kg	L1_SL_RM_DO1_M50
721									DO2	≥100	M25	≤25%	kg	L1_SL_RM_DO2_M25
722											M50	≤50%	kg	L1_SL_RM_DO2_M50

723							RV	Rolls – big bales	DO1	≤100	M25	≤25%	kg	L1_SL_RV_DO1_M25
724											M50	≤50%	kg	L1_SL_RV_DO1_M50
725									DO2	≥100	M25	≤25%	kg	L1_SL_RV_DO2_M25
726											M50	≤50%	kg	L1_SL_RV_DO2_M50
727							RA	Loose biomass	DR1	≤90	M25	≤25%	kg	L1_SL_RA_DR1_M25
728											M50	≤50%	kg	L1_SL_RA_DR1_M50
729									DR2	≥90	M25	≤25%	kg	L1_SL_RA_DR2_M25
730											M50	≤50%	kg	L1_SL_RA_DR2_M50
731							RU	Loose biomass - fragmented	DU1	≤100	M25	≤25%	kg	L1_SL_RU_DU1_M25
732											M50	≤50%	kg	L1_SL_RU_DU1_M50
733									DU2	≥100	M25	≤25%	kg	L1_SL_RU_DU2_M25
734											M50	≤50%	kg	L1_SL_RU_DU2_M50
735	H	Residues of leafy plants from gardens, parks, road maintenance, orchards and vineyards	H1	Grass	WP	Whole plants	PE	Pellets	DP1	≤600	M15	≤15%	kg	H1_WP_PE_DP1_M15
736											M20	≤20%	kg	H1_WP_PE_DP1_M20
737									DP2	≥600	M15	≤15%	kg	H1_WP_PE_DP2_M15
738											M20	≤20%	kg	H1_WP_PE_DP2_M20
739							BR	Briquettes	DB1	≤500	M20	≤20%	kg	H1_WP_BR_DB1_M20
740											M20	≤20%	kg	H1_WP_BR_DB1_M20
741									DB2	≥500	M20	≤20%	kg	H1_WP_BR_DB2_M20
742											M20	≤20%	kg	H1_WP_BR_DB2_M20

743							KM	Cubes – small bales	DK1	≤100	M25	≤25%	kg	H1_WP_KM_DK1_M25
744											M50	≤50%	kg	H1_WP_KM_DK1_M50
745									DK2	≥100	M25	≤25%	kg	H1_WP_KM_DK2_M25
746											M50	≤50%	kg	H1_WP_KM_DK2_M50
747							KV	Cubes – big bales	DK3	≤150	M25	≤25%	kg	H1_WP_KV_DK3_M25
748											M50	≤50%	kg	H1_WP_KV_DK3_M50
749									DK4	≥150	M25	≤25%	kg	H1_WP_KV_DK4_M25
750											M50	≤50%	kg	H1_WP_KV_DK4_M50
751							KU	Cubes – big bales - fragmented	DK3	≤150	M25	≤25%	kg	H1_WP_KU_DK3_M25
752											M50	≤50%	kg	H1_WP_KU_DK3_M50
753									DK4	≥150	M25	≤25%	kg	H1_WP_KU_DK4_M25
754											M50	≤50%	kg	H1_WP_KU_DK4_M50
755							RM	Rolls – small bales	DO1	≤100	M25	≤25%	kg	H1_WP_RM_DO1_M25
756											M50	≤50%	kg	H1_WP_RM_DO1_M50
757									DO2	≥100	M25	≤25%	kg	H1_WP_RM_DO2_M25
758											M50	≤50%	kg	H1_WP_RM_DO2_M50
759							RV	Rolls – big bales	DO1	≤100	M25	≤25%	kg	H1_WP_RV_DO1_M25
760											M50	≤50%	kg	H1_WP_RV_DO1_M50
761									DO2	≥100	M25	≤25%	kg	H1_WP_RV_DO2_M25
762											M50	≤50%	kg	H1_WP_RV_DO2_M50
763							RA	Loose biomass	DR1	≤90	M25	≤25%	kg	H1_WP_RA_DR1_M25

764											M50	≤50%	kg	H1_WP_RA_DR1_M50
765									DR2	≥90	M25	≤25%	kg	H1_WP_RA_DR2_M25
766											M50	≤50%	kg	H1_WP_RA_DR2_M50
767							RU	Loose biomass - fragmented	DU1	≤100	M25	≤25%	kg	H1_WP_RU_DU1_M25
768											M50	≤50%	kg	H1_WP_RU_DU1_M50
769									DU2	≥100	M25	≤25%	kg	H1_WP_RU_DU2_M25
770											M50	≤50%	kg	H1_WP_RU_DU2_M50
771			H2	Wood biomass	WP	Whole plant	PE	Pellets	DP1	≤600	M15	≤15%	kg	H2_WP_PE_DP1_M15
772											M20	≤20%	kg	H2_WP_PE_DP1_M20
773									DP2	≥600	M15	≤15%	kg	H2_WP_PE_DP2_M15
774											M20	≤20%	kg	H2_WP_PE_DP2_M20
775							BR	Briquettes	DB1	≤500	M15	≤15%	kg	H2_WP_BR_DB1_M15
776											M20	≤20%	kg	H2_WP_BR_DB1_M20
777									DB2	≥500	M15	≤15%	kg	H2_WP_BR_DB2_M15
778											M20	≤20%	kg	H2_WP_BR_DB2_M20
779							RV	Rolls – big bales	DO1	≤160	M25	≤25%	kg	H2_WP_RV_DO1_M25
780											M50	≤50%	kg	H2_WP_RV_DO1_M50
781									DO2	≥160	M25	≤25%	kg	H2_WP_RV_DO2_M25
782											M50	≤50%	kg	H2_WP_RV_DO2_M50
783							RA	Loose biomass	DR1	≤300	M25	≤25%	kg	H2_WP_RA_DR1_M25
784											M50	≤50%	kg	H2_WP_RA_DR1_M50
785									DR2	≥300	M25	≤25%	kg	H2_WP_RA_DR2_M25
786											M50	≤50%	kg	H2_WP_RA_DR2_M50

787							RU	Loose biomass - fragmented	DU1	≤300	M25	≤25%	kg	H2_WP_RU_DU1_M25
788											M50	≤50%	kg	H2_WP_RU_DU1_M50

5.2 Trading codes for manure

ITEM NR.	CODE	TYPE OF BIOMASS	CODE	SPECIES OF ANIMALS	CODE	ADDITIVES	CODE	SEPARATION	CODE	SOLID MATTER CONTENT	UNIT OF MEASUREMENT	TRADING CODE
001	S	Manure	SD	Dairy cows	BP	Without bedding	BS	Without separation	M5	≤5%	kg	SD_BP_BS_M5
002	S	Manure							M15	≤15%	kg	SD_BP_BS_M15
003	S	Manure							M25	≤25%	kg	SD_BP_BS_M25
004	S	Manure					SS	With separation	M20	≤20%	kg	SD_BP_SS_M20
005	S	Manure							M40	≤40%	kg	SD_BP_SS_M40
006	S	Manure							M60	≤60%	kg	SD_BP_SS_M60
007	S	Manure			SP	With bedding	BS	Without separation	M40	≤40%	kg	SD_BP_BS_M40
008	S	Manure							M60	≤60%	kg	SD_BP_BS_M60
009	S	Manure							M80	≤80%	kg	SD_BP_BS_M80
010	S	Manure					SS	With separation	M50	≤50%	kg	SD_BP_SS_M50
011	S	Manure							M70	≤70%	kg	SD_BP_SS_M70
012	S	Manure							M90	≤90%	kg	SD_BP_SS_M90
013	S	Manure	SB	Fattening cattle	BP	Without bedding	BS	Without separation	M5	≤5%	kg	SB_BP_BS_M5
014	S	Manure							M15	≤15%	kg	SB_BP_BS_M15
015	S	Manure							M25	≤25%	kg	SB_BP_BS_M25
016	S	Manure					SS	With separation	M20	≤20%	kg	SB_BP_SS_M20

017	S	Manure							M40	≤40%	kg	SB_BP_SS_M40
018	S	Manure							M60	≤60%	kg	SB_BP_SS_M60
019	S	Manure			SP	With bedding	BS	Without separation	M40	≤40%	kg	SB_BP_SS_M40
020	S	Manure							M60	≤60%	kg	SB_BP_SS_M60
021	S	Manure							M80	≤80%	kg	SB_BP_SS_M80
022	S	Manure					SS	With separation	M50	≤50%	kg	SB_BP_SS_M50
023	S	Manure							M70	≤70%	kg	SB_BP_SS_M70
024	S	Manure							M90	≤90%	kg	SB_BP_SS_M90
025	S	Manure	SS	Pigs	BP	Without bedding	BS	Without separation	M5	≤5%	kg	SS_BP_SS_M5
026	S	Manure							M15	≤15%	kg	SS_BP_SS_M15
027	S	Manure							M25	≤25%	kg	SS_BP_SS_M25
028	S	Manure					SS	With separation	M20	≤20%	kg	SS_BP_SS_M20
029	S	Manure							M40	≤40%	kg	SS_BP_SS_M40
030	S	Manure							M60	≤60%	kg	SS_BP_SS_M60
031	S	Manure			SP	With bedding	BS	Without separation	M40	≤40%	kg	SS_BP_SS_M40
032	S	Manure							M60	≤60%	kg	SS_BP_SS_M60
033	S	Manure							M80	≤80%	kg	SS_BP_SS_M80
034	S	Manure					SS	With separation	M50	≤50%	kg	SS_BP_SS_M50
035	S	Manure							M70	≤70%	kg	SS_BP_SS_M70
036	S	Manure							M90	≤90%	kg	SS_BP_SS_M90
037	S	Manure	SP	Poultry	BP	Without bedding	BS	Without separation	M5	≤5%	kg	SP_BP_SS_M5
038	S	Manure							M15	≤15%	kg	SP_BP_SS_M15

039	S	Manure							M25	≤25%	kg	SP_BP_BS_M25
040	S	Manure					SS	With separation	M20	≤20%	kg	SP_BP_SS_M20
041	S	Manure							M40	≤40%	kg	SP_BP_SS_M40
042	S	Manure							M60	≤60%	kg	SP_BP_SS_M60
043	S	Manure			SP	With bedding	BS	Without separation	M40	≤40%	kg	SP_BP_BS_M40
044	S	Manure							M60	≤60%	kg	SP_BP_BS_M60
045	S	Manure							M80	≤80%	kg	SP_BP_BS_M80
046	S	Manure					SS	With separation	M50	≤50%	kg	SP_BP_SS_M50
047	S	Manure							M70	≤70%	kg	SP_BP_SS_M70
048	S	Manure							M90	≤90%	kg	SP_BP_SS_M90
049	S	Manure	SH	Horses	BP	Without bedding	BS	Without separation	M15	≤15%	kg	SH_BP_BS_M15
050	S	Manure							M25	≤25%	kg	SH_BP_BS_M25
051	S	Manure					SS	With separation	M50	≤50%	kg	SH_BP_SS_M50
052	S	Manure							M80	≤80%	kg	SH_BP_SS_M80
053	S	Manure			SP	With bedding	BS	Without separation	M30	≤30%	kg	SH_BP_BS_M30
054	S	Manure							M50	≤50%	kg	SH_BP_BS_M50
055	S	Manure					SS	With separation	M70	≤70%	kg	SH_BP_SS_M70
056	S	Manure							M90	≤90%	kg	SH_BP_SS_M90
057	S	Manure	SG	Goats and sheep	BP	Without bedding	BS	Without separation	M15	≤15%	kg	SG_BP_BS_M15
058	S	Manure							M25	≤25%	kg	SG_BP_BS_M25
059	S	Manure					SS	With separation	M50	≤50%	kg	SG_BP_SS_M50
060	S	Manure							M80	≤80%	kg	SG_BP_SS_M80

061	S	Manure			SP	With bedding	BS	Without separation	M30	≤30%	kg	SG_BP_BS_M30
062	S	Manure							M50	≤50%	kg	SG_BP_BS_M50
063	S	Manure					SS	With separation	M70	≤70%	kg	SG_BP_SS_M70
064	S	Manure							M90	≤90%	kg	SG_BP_SS_M90

REFERENCE

- [1] Alimpić M.: Energija iz poljoprivrede, časopis (1983) "Savremena poljoprivredna tehnika", Vojvođansko društvo za poljoprivrednu tehniku, Novi Sad, 9(1-2), 1-7;
- [2] Brkić M, Janić T. (1998) Mogućnosti korišćenja biomase u poljoprivredi, Zbornik radova sa II savetovanja: "Briketiranje i peletiranje biomase iz poljoprivrede i šumarstva", Regionalna privredna komora, Sombor, „Dacom“, Apatin, 5-9;
- [3] Brkić M, Janić T, Somer D. (2006). Termotehnika u poljoprivredi – II deo: Procesna tehnika i energetika, Poljoprivredni fakultet, Novi Sad, 323;
- [4] Brkić, M, Potkonjak V, Somer D, Zoranović, M, Đukić, Đ. (1995). Fazni izveštaj po projektu (PR – 262): "Proizvodnja biogasa iz sekundarnih sirovina poljoprivrede i prehrambene industrije- korišćenje biogasa i prevrelog ostatka, Poljoprivredni fakultet, Novi Sad, 47;
- [5] Brkić, M, Janić, T. (2009). Briketiranje i peletiranje biomase, monografija, Poljoprivredni fakultet, Novi Sad, 253;
- [6] Callé, F. R. (2007) The Biomass Assessment Handbook: Bioenergy for a Sustainable Environment, Earthscan, London, 269;
- [7] Charles Fulhage, John Hoehne (2001) Planning and Evaluation of Manure Storage, University of Missouri, 24;
- [8] Hartmann, H.: Ernte. In: Kaltschmitt, M.; Hartmann, H.; Hofbauer, H. (Hrsg.) (2009) Energie aus Biomasse – Grundlagen, Techniken und Verfahren. 2. Aufl. Heidelberg: Springer, S. 217–244;
- [9] Janić, T. (2000). Kinetika sagorevanja balirane pšenične slame, doktorska disertacija, Poljoprivredni fakultet, Novi Sad, 123;
- [10] Katić Z. (1982). Energetska valjanost poljoprivredne proizvodnje i njena zavisnost sa granicama energetskog obračuna, Zbornik radova: "Aktualni problemi mehanizacije poljoprivrede", Fakultet poljoprivrednih znanosti, Zagreb;
- [11] Kosi F. (2003) Ostaci biomase u stočarstvu - tečni stajnjak, studija: "Energetski potencijal i karakteristike ostataka biomase i tehnologije za njenu pripremu i energetsko iskorišćenje u Srbiji", Institut za nuklearne nauke "Vinča", Beograd, 11-24;
- [12] Kovčin S. (1993) Analiza stanja u oblasti proizvodnje i korišćenja stajnjaka, monografija: "Proizvodnja i korišćenje biogasa iz stajnjaka", Poljoprivredni fakultet, Novi Sad, 5-11;
- [13] Loo, V. S., Koppejan, J. (2008) Biomass combustion and co-firing, Earthscan, London, 442;
- [14] Martinov M. (1980) Toplotna moć slame žita uzgajanih na području SAP Vojvodine, časopis: "Savremena poljoprivredna tehnika", VDPT, Novi Sad, 6(3): 95 – 101;
- [15] Mitić D. (1998). Fizičke karakteristike biomasa i biobriketa Srbije (potencijalna ekološka goriva), monografija, JDPTEP, JSDITZ, Novi Sad – Niš, 119;
- [16] Novaković D, Đević M. (2000). Ostaci rezidbe u voćarstvu i vinogradarstvu kao izvor energije, PTEP, JDPTEP, Novi Sad, 4(1-2): 51-53;

- [17] Novaković D, Đević M, Radojević, D. (2003) Ostaci biomase u voćarstvu i vinogradarstvu, studija: "Energetski potencijal i karakteristike ostataka biomase i tehnologije za njenu pripremu i energetska iskorišćenje u Srbiji, Institut za nuklearne nauke "Vinča", Beograd, 6-10. 42/73;
- [18] Potkonjak V. (2007). Tehnika spremanja biomase, studija NPEE 273022A: "Tehnoekonomska karakterizacija, tipizacija i izbor kapaciteta i postrojenja za korišćenje biomase u sušarama i proizvodnim pogonima ZZ „Bag-Deko“ u Bačkom Gradištu", Poljoprivredni fakultet, Novi Sad, 146.
- [19] Vujić G. i sar. (2009) Utvrđivanje sastava otpada i procene količine u cilju definisanja strategije upravljanja sekundarnim sirovinama u sklopu održivog razvoja Republike Srbije, preliminarni izveštaj po projektu, Departman za inženjerstvo zaštite životne sredine, Fakultet tehničkih nauka, Novi Sad, 99.