

Chapter NR 240

DAIRY PRODUCTS PROCESSING

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NR 240.01 Purpose. The purpose of this chapter is to establish effluent limitations, standards of performance, and pretreatment standards for discharges of process wastes from the dairy products processing industry category of point sources and subcategories thereof.

Note: The authority for promulgation of this chapter is set forth in ch. NR 205.
History: Cr. Register, June, 1976, No. 246, eff. 7-1-76.

NR 240.02 Applicability. The effluent limitations, standards of performance, pretreatment standards, and other provisions in this chapter are applicable to pollutants or pollutant properties in discharges of process waste resulting from operations or manufacture in any or a combination of the following subcategories.

c1d RECEIVING STATIONS. Facilities in this subcategory are those engaged in the assembly and reshipment of bulk milk for the use of manufacturing or processing plants;

cad Class A facilities are those receiving more than 15,600 pounds per day BOD input c150,000 pounds milk equivalentd, and

cbd Class B facilities are those receiving less than class A.

c2d FLUID PRODUCTS. Facilities in this subcategory are those manufacturing market milk cranging from 3.5% fat content to fat freed, flavored milk cchocolate and othersd, and cream cof various fat contents, plain or whippedd;

cad Class A facilities are those receiving more than 25,900 pounds per day BOD input c250,000 pounds milk equivalentd, and

cbd Class B facilities are those receiving less than class A.

c3d CULTURED PRODUCTS. Facilities in this subcategory are those manufacturing cultured products, including cultured skim milk, cultured buttermilk, yogurt, sour cream, and dips of various types;

cad Class A facilities are those receiving more than 6,200 pounds per day BOD input c60,000 pounds milk equivalentd, and

cbd Class B facilities are those receiving less than class A.

c4d BUTTER. Facilities in this subcategory are those manufacturing butter either by churning or a continuous process;

cad Class A facilities are those processing more than 18,180 pounds per day BOD input c175,000 pounds milk equivalentd, and

cbd Class B facilities are those processing less than class A.

c5d COTTAGE AND CREAM CHEESE. Facilities in this subcategory are those manufacturing cottage cheese and cultured cream cheese;

cad Class A facilities are those processing more than 2,600 pounds per day BOD input c25,000 pounds milk equivalentd, and

cbd Class B facilities are those processing less than class A.

c6d NATURAL AND PROCESSED CHEESE. Facilities in this

subcategory are those manufacturing natural cheese chard curdd and processed cheese;

cad Class A facilities are those processing more than 10,390 pounds per day BOD input c100,000 pounds milk equivalentd, and

cbd Class B facilities are those processing less than class A.

c7d FLUID MIX FOR FROZEN PRODUCTS. Facilities in this subcategory are those manufacturing fluid mixes for ice cream and other frozen desserts cfor later freezing in other plantsd;

cad Class A facilities are those having a dairy products input of more than 8,830 pounds per day BOD input c85,000 pounds milk equivalentd, and

cbd Class B facilities are those having a dairy products input less than class A.

c8d ICE CREAM AND FROZEN PRODUCTS. Facilities in this subcategory are those manufacturing ice cream, ice milk, sherbert, water ices, stick confections, frozen novelty products, frozen desserts, mellorine, pudding, and other dairy product base desserts;

cad Class A facilities are those having a dairy products input of more than 8,830 pounds per day BOD input c85,000 pounds milk equivalentd, and

cbd Class B facilities are those having a dairy products input of less than class A.

c9d CONDENSED MILK. Facilities in this subcategory are those manufacturing condensed whole milk, condensed skim milk, sweetened condensed milk, and condensed buttermilk;

cad Class A facilities are those condensing more than 10,390 pounds per day BOD input c100,000 pounds milk equivalentd, and

cbd Class B facilities are those condensing less than class A.

c10d DRY MILK. Facilities in this subcategory are those manufacturing dry whole milk, dry skim milk, and dry buttermilk;

cad Class A facilities are those with an input equivalent to more than 15,070 pounds per day BOD input c145,000 pounds milk equivalentd, and

cbd Class B facilities are those with an input less than class A.

c11d CONDENSED WHEY. Facilities in this subcategory are those manufacturing condensed sweet whey and condensed acid whey;

cad Class A facilities are those with more than 14,160 pounds per day BOD input c300,000 pounds of raw fluid whey containing 20,700 pounds solidsd, and

cbd Class B facilities are those with an input less than class A.

c12d DRY WHEY. Facilities in this subcategory are those manufacturing sweet or acid dry whey;

cad Class A facilities are those with more than 15,620 pounds

per day BOD input c57,000 pounds of 40% solids whey containing 22,800 pounds of solids, and

cbd Class B facilities are those with an input less than class A.
History: Cr. Register, June, 1976, No. 246, eff. 7-1-76.

NR 240.03 Definitions. The following definitions are applicable to terms used in this chapter. Definitions of other terms and meanings of abbreviations are set forth in ch. NR 205.

c1d XBOD input Y means the 5 day biochemical oxygen demand of the materials entered into process. It can be calculated by multiplying the amounts of fats, proteins, and carbohydrates by factors of 0.890, 1.031, and 0.691, respectively. Organic acids, e.g. lactic acid, should be included as carbohydrates. The composition of input materials may be based on either,

- cad Direct analysis, or
- cbd Generally accepted published values such as specifically those in s. NR 240.07.

c2d XMilk equivalent Y means the quantity of 3.7% fat content whole milk necessary to supply one pound of fluid raw material to a process.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76.

NR 240.04 Compliance with effluent limitations and standards. Discharge of pollutants from facilities subject to the provisions of this chapter may not exceed, as appropriate:

c1d By July 1, 1977 effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available;

c2d By July 1, 1983 effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable;

c3d Pretreatment standards for discharges to publicly owned treatment works;

c4d Standards of performance for new sources.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76; r. and recr. Register, August, 1983, No. 332, eff. 9-1-83.

NR 240.06 Application of effluent limitations and standards. c1d The effluent limitations and standards set forth in this chapter shall be used in accordance with this section to establish the quantity or quality of pollutants or pollutant prop-

erties which may be discharged by a point source subject to the provisions of this chapter, except as;

cad They may be modified in accordance with subch. IV of ch. NR 220,

cbd They may be superseded by more stringent limitations and standards necessary to achieve water quality standards or meet other legal requirements, or

ccd They may be supplemented or superseded by standards or prohibitions for toxic pollutants or by additional limitations for other pollutants required to achieve water quality.

c2d The production basis for application of the limitations and standards set forth in this chapter shall be the daily average for a maximum month for the facility in each subcategory subject to the provisions of this chapter.

c3d For a facility which manufactures one or more final products in only one of the subcategories of s. NR 240.02 using a process or processes involving the production of intermediate products in any other subcategories the total discharge limitation shall be the total of the amounts calculated from the BOD input in the final product subcategory and each of such other subcategories involved, except that,

cad Such other subcategories shall not include receiving stations, subcategory c1d, and

cbd If the facility is in subcategory c8d the total discharge limitation shall not include any amounts calculated for fluid mixes it prepares and shall be reduced by the amounts calculated for any fluid mixes it receives from other facilities.

c4d For a facility which manufactures final products in more than one of the subcategories of s. NR 240.02 the total discharge limitation shall be the total of the amounts calculated in accordance with sub. c3d for each final product subcategory involved.

Note: For example, a facility receives daily 300,000 pounds of 3.7% fat content whole milk, sells 100,000 pounds, makes cheese from 200,000 pounds, and produces dry whey, from the 180,000 pounds of fluid whey containing 12,480 pounds of solids produced in the cheese process. Dry whey production involves the intermediate production of condensed whey. The facility has final products in subcategory c1d cclass Bd, c6d cclass Ad, and c12d cclass Bd and an intermediate product in subcategory c11d cclass Bd. Discharge limitations for the facility are calculated using s. NR 240.07 data to determine BOD input, and average effluent limitations in s. NR 240.10 to determine discharge limitations to be achieved by best practicable treatment, as shown in the table with data in pounds except that the BOD factor is in pounds for 100 pounds of raw materials and the effluent limitation in pounds per 1000 pounds of BOD input.

Product ccolumn d	Material Used 1	BOD Factor 2	BOD Input 3	Effluent Limitations		Discharge Limitations	
				4	5	6	7
				BOD	TSS	BOD	TSS
raw milk	100,000 milk	10.39	10,390	0.31	0.47	3.2	4.9
cheese	200,000 milk	10.39	20,780	0.29	0.44	6.0	9.1
cond. whey	180,000 whey	4.72	8,596	0.65	0.98	5.5	8.3
dry whey	180,000 whey	4.72	8,596	0.65	0.98	5.5	8.3
TOTAL						20.2	30.6

for column 3 divide column 1 by 100 and multiply by column 2; for columns 6 and 7 divide column 3 by 1000 and multiply by columns 4 and 5 respectively

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76; correction in c1d cad made under s. 13.92 c4d cbd 7, Stats., Register April 2018 No. 748.

NR 240.07 BOD of dairy product materials. The data in table 1 taken from the development document incorporated by reference in subch. IV of ch. NR 220, are generally accepted published values for the protein, fat, and carbohydrate content and

BOD equivalent of common dairy products process materials and may be used to determine the BOD input of such materials in facilities subject to the provisions of this chapter.

Table 1

BOD of Dairy Product Materials

Material	% Protein	% Fat	% Carbohydrate	BOD ₅ kg{100kg clb{100lbd
Almonds cdriedd	18.6	54.2	19.5	80.89
Blackberries ccanned, light syrupd	0.8	0.6	17.3	13.30
Buttermilk				
Fluid ccultured skim milkd	3.6	0.1	5.1	7.22
Dried	34.6	5.3	50.0	74.63
Chocolate csemisweetd	4.2	35.7	57.0	65.49
Cheese				
Brick	22.2	30.5	1.9	51.35
Cheddar	25.0	32.2	2.1	55.89
Cottage cuncreamedd	17.0	0.3	2.7	19.66
Cherries csweet, light syrupd	0.9	0.2	16.5	12.51
Cocoa cdry powder, low-medium fatd	19.2	12.7	53.8	68.17
Cream cfluidd				
Half-and-Half	3.2	11.7	4.6	16.89
Light ccoffee or tabled	3.0	20.6	4.3	24.39
Light whipping	2.5	31.3	3.6	32.93
Heavy whipping	2.2	37.6	3.1	37.87
40 Percent	2.1	40.0	2.9	39.77
Milk cfluidd				
Whole, 3.7% Fat	3.5	3.7	4.9	10.39
Whole, 3.5% Fat	3.5	3.5	4.9	10.23
Skim	3.6	0.1	5.1	7.44
Milk ccannedd				
Evaporated cunsweetenedd	7.0	7.9	9.7	21.74
Condensed csweetenedd	8.1	8.7	54.3	53.76
Milk cdriedd				
Whole	26.4	27.5	38.2	78.85
Skim	35.9	0.8	52.3	75.01
Orange juice				
All commercial varieties	0.7	0.2	10.4	7.85
Peaches, canned				
Water pack	0.4	0.1	8.1	6.11
Juice pack	0.6	0.1	11.6	8.75
Pecans	9.2	71.2	14.6	83.17
Strawberries				
Canned, water pack	0.4	0.1	5.6	4.40
Frozen, sweetened	0.4	0.2	23.5	17.06
Sugar	0.0	0.0	99.5	68.75
Walnuts, black	20.5	59.3	14.8	85.15
Whey				
Fluid	0.9	0.3	5.1	4.72
Dried	12.9	1.1	73.5	65.07
40 Percent Solids	5.5	0.5	30.1	26.71

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76; correction made under s. 13.92 c4d cbd 7, Stats., Register April 2018 No. 748.

NR 240.10 Effluent limitations, best practicable treatment. The following effluent limitations for all or specific subcategories when applied in accordance with s. NR 240.06 establish, except as provided in subch. IV of ch. NR 220, the quantity or quality of pollutants or pollutant properties which may be discharged by a facility subject to the provisions of this chapter after application to process wastes of the best practicable control technology currently available.

c1d The pH of all discharges shall be within the range of 6.0 to 9.0.

c2d The 30-day average and daily maximum limitations for BOD₅ and suspended solids are set forth in table 2 in lbs{ 1000lbs or kg{ 1000kg of BOD₅ input.

Table 2

Subcategory	BPT Effluent Limitations				
	Class	BOD ₅		TSS Suspended Solids	
		Average	Maximum	Average	Maximum
Receiving stations	cAd	0.19	0.48	0.29	0.71
	cBd	0.31	0.63	0.47	0.94
Fluid products	cAd	1.35	3.38	2.03	5.51
	cBd	2.25	4.50	3.38	6.75
Cultured products	cAd	1.35	3.38	2.03	5.06
	cBd	2.25	4.50	3.38	6.75
Butter	cAd	0.55	1.38	0.83	2.06
	cBd	0.91	1.83	1.37	2.74
Cottage and cream cheese	cAd	2.68	6.70	4.02	10.05
	cBd	4.46	8.93	6.69	13.39
Natural and processed cheese	cAd	0.29	0.73	0.44	1.09
	cBd	0.49	0.98	0.73	1.46
Fluid mixes for frozen products	cAd	0.88	2.20	1.32	3.30
	cBd	1.46	2.93	2.19	4.39
Ice cream and frozen products	cAd	1.84	4.60	2.76	6.90
	cBd	3.06	6.13	4.59	9.19
Condensed milk	cAd	1.38	3.45	2.07	5.18
	cBd*	2.30	4.60	3.45	6.90
Dry milk	cAd	0.65	1.63	0.98	2.44
	cBd	1.09	2.18	1.64	3.28
Condensed whey	cAd	0.40	1.00	0.60	1.50
	cBd*	0.65	1.30	0.98	1.95
Dry whey	cAd	0.40	1.00	0.60	1.50
	cBd	0.65	1.30	0.98	1.95

*These limitations are exclusive of barometric condenser discharges which shall be permitted with net concentration limits for BOD₅ of 10 mg/l 30 day average and 15 mg/l daily maximum.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76; correction in cintro.d made under s. 13.92 c4d cbd 7, Stats., Register April 2018 No. 748.

NR 240.11 Effluent limitations, best available treatment. The following effluent limitations for all or specific subcategories when applied in accordance with s. NR 240.06 establish the quantity or quality of pollutants or pollutant properties which may be discharged by a facility subject to the provisions of this chapter after application to process wastes of the best available technology economically achievable.

c1d The pH of all discharges shall be within the range of 6.0 to 9.0.

c2d The 30-day average and daily maximum limitations for BOD₅ and suspended solids are set forth in table 3 in lbs{1000lbs or kg{1000kg of BOD₅ input.

Table 3

Subcategory	Class	BOD ₅		TSS Suspended Solids	
		Average	Maximum	Average	Maximum
Receiving stations	cAd	0.05	0.10	0.06	0.13
	cBd	0.08	0.15	0.09	0.19
Fluid products	cAd	0.37	0.74	0.46	0.93
	cBd	0.55	1.10	0.69	1.38
Cultured products	cAd	0.37	0.74	0.46	0.93
	cBd	0.55	1.10	0.69	1.38
Butter	cAd	0.08	0.16	0.10	0.20
	cBd	0.13	0.25	0.16	0.31
Cottage cheese and cream cheese	cAd	0.74	1.48	0.93	1.85
	cBd	1.11	2.23	1.39	2.78
Natural and processed cheese	cAd	0.08	0.16	0.10	0.20
	cBd	0.13	0.25	0.16	0.31
Fluid mixes for frozen products	cAd	0.24	0.48	0.30	0.60
	cBd	0.36	0.73	0.45	0.91
Ice cream and frozen products	cAd	0.47	0.94	0.59	1.18
	cBd	0.70	1.40	0.88	1.75
Condensed milk	cAd	0.38	0.76	0.48	0.95
	cBd	0.58	1.15	0.72	1.44
Dry milk	cAd	0.28	0.36	0.23	0.45
	cBd	0.28	0.55	0.34	0.69
Condensed whey	cAd	0.11	0.22	0.14	0.28
	cBd	0.16	0.33	0.20	0.41
Dry whey	cAd	0.11	0.22	0.14	0.28
	cBd	0.16	0.33	0.20	0.41

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76.

NR 240.12 Standards of performance. The following effluent limitations for all or specific subcategories when applied in accordance with s. NR 240.06 establish the quantity or quality of pollutants or pollutant properties which may be discharged by a facility which is a new source subject to the provisions of this chapter.

c1d The pH of all discharges shall be within the range of 6.0 to 9.0.

c2d The 30-day average and daily maximum limitations for BOD₅ and suspended solids are set forth in table 4 in lbs { 1000lbs or kg { 1000kg of BOD₅ input.

Table 4

Subcategory	Standards of Performance Effluent Limitations			
	BOD ₅		TSS Suspended Solids	
	Average	Maximum	Average	Maximum
Receiving stations	0.05	0.10	0.06	0.13
Fluid products	0.37	0.74	0.46	0.93
Cultured products	0.37	0.74	0.46	0.93
Butter	0.08	0.16	0.10	0.20
Cottage and cream cheese	0.74	1.48	0.93	1.85
Natural and processed cheese	0.08	0.16	0.10	0.20
Fluid mixes for frozen products	0.24	0.48	0.30	0.60
Ice cream and frozen products	0.47	0.94	0.59	1.18
Condensed milk	0.38	0.76	0.48	0.95
Dry milk	0.18	0.36	0.23	0.45
Condensed whey	0.11	0.22	0.14	0.28
Dry whey	0.11	0.22	0.14	0.28

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76.

NR 240.13 Pretreatment standards. The pretreatment standards for discharges to publicly owned treatment works from sources subject to the provisions of this chapter shall be as set forth in ch. NR 211.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76; r. and recr. Register, August, 1983, No. 332, eff. 9-1-83.