



STORAGE CONDITIONS FOR PERISHABLE FOODS



Industrial Refrigeration Solutions

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COLD ROOM STORAGE CONDITIONS

Product	Storage conditions	Relative humidity	Approximate storage time	Water volume	Highest freezing temperature	Specific heat above freezing point	Specific heat under freezing point	latent heat
	°C	%		%	°C	kJ/kg.K	kJ/kg.K	kJ/kg
Vegetables								
Pumpkin	12 / 15	50 - 70	2 - 3 months	91	-0,8	3,97	1,81	306
Green pea	fresh	0 - 1	90 - 98	1 - 2 weeks	78,86	-0,6	3,75	1,98
	dried	10	70	6 - 8 months	12		1,24	0,99
Green pepper	dried	0 / 10	60 - 70	6 months	12		1,24	0,99
	sweet	7 / 13	90 - 95	2 - 3 weeks	92	-0,7	3,92	1,99
Broccoli	0	95-100	10 - 14 days	90,69	-0,6	4,01	1,82	303
Brussel sprouts	0	95-100	3 - 5 weeks	92,15	-0,9	3,9	1,91	287
Tomato	ripe, green	10 / 13	90 - 95	1 - 3 weeks	93	-0,5	4,02	1,77
	tough	7 / 10	90 - 95	4 - 7 days	94	-0,5	3,98	2,02
Frozen vegetables	-23/ -18		6 - 12 months					
Artichoke	0	95-100	2 weeks	84	-1,2	3,65	1,89	280
Green beans	fresh	4 / 7	95	7 - 10 days	90,27	-0,7	3,99	1,85
	dried	10	70	6 - 8 months	11		1,20	0,97
Head lettuce	0	98-100	2 - 3 weeks	95,89	-0,2	4,09	1,65	320
Carrot	underripe	0	98-100	10 — 14 days	87,79	-1,4	3,92	2
	ripe	0	98-100	7 - 9 months	88	-1,4	3,78	1,94
Parsnip	0	98-100	4 - 6 months	79	-0,9	3,48	1,83	264
Spinach	0	95-100	10 - 14 days	91,58	-0,3	4,02	1,75	306
Zucchini	summer	7 / 10	95	1 — 2 weeks	94,2	-0,3	4,07	1,74
	winter	12 / 15	50 - 70	2 - 3 months	85	-0,8	3,68	1,90
Cauliflower	0	95 - 98	3 - 4 weeks	91,91	-0,8	3,89	1,87	293
Celery	0	98-100	6 - 8 months	88	-0,9	4,02	1,84	307
Asparagus	0 / 2	95-100	2 - 3 weeks	92,4	-0,6	3,9	1,89	294
Cabbage	0	98-100	5 - 6 months	92	-0,9	3,92	1,99	307
Mushroom	0	90	7 - 14 days	91,81	-0,9	4,03	1,79	309
Parsley	0	95-100	1 - 2 months	85	-1,1	3,68	1,90	284
Corn (sweet)	0	95 - 98	4 - 8 days	74	-0,6	3,31	1,76	247
Beet	root	0	95-100	4 - 6 months	88	-0,9	3,78	1,94
	leaves	0	98-100	10 - 14 days		-0,4		
Potato	3/ 4	90 - 95	4 - 5 months	81	-0,6	3,55	1,85	270
Potato (sweet)	10-13	85 - 90	4 - 7 months	69	-1,3	3,15	1,70	230
Eggplant	7 / 12	90 - 95	7 - 10 days	93	-0,8	3,95	2,00	310
Leek (green)	0	95-100	2 - 3 months	85	-0,7	3,68	1,90	284
Cucumber	7 / 13	95	10 - 14 days	96	-0,5	4,05	2,04	320
Garlic (dried)	0	65 - 70	6 - 7 months	61	-0,8	2,88	1,60	203
Onion	green	0	95-100	3 - 4 weeks	89	-0,9	3,82	1,95
	dried	0	65 - 75	1 - 8 months	88	-0,8	3,78	1,94
Turnip	root	0	95	4 - 5 months	92	-1,1	3,92	1,99
	green leaves	0	95-100	10 - 14 days	90	-0,2	3,85	1,97
Radish	spring	0	95-100	3 - 4 weeks	95	-0,7	4,02	2,03
	winter	0	95-100	2 - 4 months	95	-0,7	4,02	2,03
Runch	-1 / 0	95-100	10 - 12 months	75	-1,8	3,35	1,78	250
Green-leafy vegetables	0	95-100	10 - 14 days	93	-0,3	3,95	2,00	310

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	°C	%		%	°C	kJ/kg.K	kJ/kg.K	kJ/kg	
Fruits									
Pineapple, ripe	7	85 - 90	2 - 4 weeks	85	-1,0	3,68	1,90	284	
Pear	-1,6 / -0,5	90 - 95	2 - 7 months	83	-1,6	3,61	1,88	277	
Quince	-1 / 0	90	2 - 3 months	85	-2,0	3,68	1,90	284	
Gooseberry	-1 / 0	90 - 95	2 - 4 weeks	89	-1,1	3,82	1,95	297	
Blackberry	0	90 - 95	10 - 18 days	84,61	-1,3	3,83	2,06	283	
Strawbeery	-0,5 / 0	90 - 95	5 - 7 days	90	-0,8	3,85	1,97	300	
Frozen fruits	-24 / -18	90 - 95	18 - 24 months						
Apple	0/3	90-95	3-8 months	84	-1,1	3,65	1,89	280	
	dried	55-60	3-6 months	31,76		2,57	2,84	106	
Plum	1,89	280	2-5 weeks	85,2	-0,8	3,83	1,9	310	
Grapefruit	10/16	85-90	4-6 weeks	90,89	-1,1	3,96	1,89	284	
Coconut	0/1	90-95	3-5 months	82	-0,8	3,58	1,87	273	
Date	-18 or 0	75 or less	6 - 12 months	22,5	-15,7	2,31	2,3		
Linden	8/9	85-90	6-8 weeks	86	-1,6	3,81	1,92		
Fig	dried	0/ 4	50-60	9-12 months	23		1,61	1,12	
	fresh	0	85-90	7-10 days	79,11	-2,4	3,7		
Persisan melon	7/10	90-95	2 weeks	93	-0,8	3,95			
Watermelon	10/15	90	2-3 weeks	93	-0,4	3,87			
Apricot		90-95	1-3 weeks	86,35	-1,1	3,85	2,05	288	
Cherry	sour	0	90-95	3-7 days	86,13	-1,7	3,73	2,12	270
	sweet	-1/ -0,5	90-95	2-3 weeks	80,76	-2,1	3,51	1,84	267
Kiwi	0	90-95	3-5 months	82	-0,9	3,71	1,95	274	
Currant	-0,5/ 0	90-95	1-4 weeks	81,96	-1,0	3,94	2,02	292	
Lemon	0/10	85-90	1-6 months	87,4	-1,4	3,56	2,03	248	
Mandarin	0/3	85-90	2-3 weeks	87	-1,1	3,7	2,3	270	
Banana	13/15	90-95	1-4 weeks	74,26	-0,8	3,86	1,9	288	
Pomegranate	5	90-95	2-3 months	80,97	-3,0	3,81	1,96	275	
Nectars	0	90-95	2-4 weeks	86,28	-0,9	2,57	3,49	106	
Orange	0/9	85-90	3-12 weeks	82,3	-1	3,76	2,07	267	
Peach	fresh	-0,5/0	90-95	2-4 weeks	89	-0,9	3,82	1,95	297
	dried	0/5	55-60	5-8 months	25		1,67	1,15	
Fresh olive	5/10	85-90	4-6 weeks	75	-1,4	3,35	1,78	250	
Grape	americana	-1/0	90-95	2-8 weeks	82	-1,6	3,58	1,86	274
	grapevine	-1 0	90-95	3-6 months	82	-2,1	3,58	1,86	274
Meat and Poultry Meat									
Cattle	meat(cold)	-2 / 1	88 - 95	1 week	62 / 77	-2,2 / 2,7	2,9 / 3,4	1,6 / 1,8	206-257
	tenderloin	0 / 1	85	1 - 3 weeks	56		2,71	1,54	187
	meat (frozen)	-20	90 - 95	6 - 12 months					
Liver	0	90	5 days	70	-1,7	3,18	1,71	233	
Beef	-2 / 1	85 - 95	3 weeks	66		3,05	1,66	220	
Mutton	mutton(cold)	-2 / 1	85 - 90	3 - 4 weeks	60 / 70	-2,2 / -1,7	2,8 - 3,2	1,6 / 1,7	200-233
	leg of mutton	0	85	5 - 12 days	65		3,01	1,65	217
	mutton(frozen)	-23/ -18	90 - 95	8 - 12 months					
Spring chicken	cold	-2 / 0	95-100	1 - 3 weeks	74	-2,8	3,31	1,76	247
	frozen	-23/ -18	90 - 95	12 months					
Any kind of chicken	-2 / 0	95-100	1 - 4 weeks	74	-2,8	3,31	1,76	247	
Chicken leftovers	0 / 1	85	3 - 7 days	8		1,10	0,94		
Jambon	%74 nonfet	0 / 1	80 - 85	3 - 5 days	56	-1,7	2,71	1,54	187
	nonfet	3/ 5	80 - 85	1 - 2 days	57		2,74	1,55	190
	frozen	-23/ -18	90 - 95	6 - 8 months					

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Meat and Poultry Meat(more)									
Bacon	fat	3 / 5	80 - 85	2 - 3 weeks	19	1,47	1,07	63	63
	frozen	-23 / -18	90 - 95	2 - 4 months					
Fermented sausage	fresh	0 / 1	85	1 - 7 days	38		2,11	1,31	127
	smoked	0	85	1 - 3 weeks	50	-3,9	2,51	1,46	167
Any kind of turkey		-2 / 0	95-100	1 - 4 weeks	64	-2,8	2,98	1,64	213
Hindi goes		-20 / -18		6 - 12 months					
Fowl		-2 / 0	95-100	1 week	69	-2,8	3,15	1,70	230
Frozen white meat		-23 / -18	90 - 95	12 months					
Dairy Products									
Butter	fresh	0	75 - 85	12 months	16	-20 / -0,6	1,37	1,04	53
	frozen	-23	70 - 85	6 months					
Feta cheese	frozen			12 months					
	long-term stored	0 / 1	65	12 months	37	-13	2,07	1,30	123
	short-term stored	4,4	65	3 - 23 months	37	-13	2,07	1,30	123
	processed	4,4	65	7 days	39	-7,2	2,14	1,32	130
	shredded	4,4	65	2 - 4 months	31		1,87	1,22	103
Ice cream (%10 fat)		-29 / -26	90 - 95	2 days	63	-5,6	2,95	1,63	210
Milk	liquid, pasteurized	4 / 6		6 - 9 months					
	a class %3,7 fat	0 / 1		16 months	87	-0,6	3,75	1,93	290
	raw milk	0 / 4		2 days					
	dried	21	low	6 - 9 months	2		0,90	0,86	67
	dried, nonfat	7 / 21	low	16 months	3		0,94	0,89	10
Sea Foods (Fish)									
Gadoid fish		-1 / 1	95- 100	12 days	81	-2,2	3,55	1,85	270
Turbot		-1 / 1	95- 100	18 days	75	-2,2	3,35	1,78	250
Red herring		0 / 2	80 - 90	10 days	61	-2,2	2,88	1,60	203
Salmon		-1 / 1	95- 100	18 days	64	-2,2	2,98	1,64	213
Tuna		0 / 2	95- 100	14 days	70	-2,2	3,18	1,71	233
Frozen fishes		-29 / -18	90 - 95	6 - 12 months					
Sea Foods (Crustacean)									
Shrimp		-1 / 1	95-100	12-14 days	76	-2,2	3,38	1,79	254
Lobster		5 / 10		No limit	-2,2	3,48	1,83	264	
Oyster		0 / 2	100	5-8 days	87	-2,2	3,75	1,93	290
Oyster with shell		5 / 10	95 -100	5 days	80	-2,8	3,51	1,84	267
Others									
Egg	with shell	-2 / 0	80 - 90	5 - 6 months	66	-2,2	3,05	1,66	220
	frozen	< -18		More than 1 year	74		3,31	1,76	247
	yolk	2 / 4	low	6 - 12 months	3 - 5		0,97	0,89	13
Beer		2 / 4		3 - 8 weeks	90	-2,2	3,85	1,97	300
Bread		-18		3 - 13 weeks	32 - 37		1,99	1,27	106-123
Canned food		0 / 16	<70	1 year					
Honey		ниже 10		More than 1 year	17		1,40	1,05	57
Nut		0 / 10	65 - 75	8 - 12 months	3 - 6		0,94 — 1,04	0,88 — 0,91	10 - 20
Vegetable oil		21		More than 1 year	0				
Margarin		2	60 - 70	More than 1 year	16		1,37	1,04	53
Orange juice		-1 / 2		3 - 6 weeks	89		3,82	1,94	297
Milk chocolate		-18 / 1	40	6 - 12 months	1		0,87	0,85	3,3
Chocolate with nuts		-18 / 1	40	1,5 - 6 months	2		0,90	0,86	6,7