Biblical and Talmudic units of Measurement

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Sources: The size of Talmudic units is a matter of controversy between: [A] R' Chaim Naeh. *Shi'urei Torah. 1947*, [B] the Hazon Ish (Rabbi Avraham Yeshayahu Karelitz 1878-1953) *Moed* 39: *Kuntres Hashiurim* and [C] R' Moshe Feinstein (*Iggerot Moshe OC* I:136,*YD* I:107,*YD* I:190,*YD* III:46:2,*YD* III:66:1). See also Adin Steinsaltz. *The Talmud, the Steinsaltz edition: a Reference Guide.* Israel V. Berman, translator & editor NY: Random House, *1989*, pp.279-293.

Volume

Chomer[1] (dry)=**kor** (dry,liquid). **Adriv**=[2]**letech** (dry). **Ephah**[3] (dry)=[4]**Bat**[5] (liquid). **Se'ah** (dry)[6]. **Arbaim Se'ah** (40 *se'ah*), the min. quantity of *kor*[7] water necessary for a *mikveh* (ritual bath), is the vol. of 1x1x3 *amot*[8]. **Tarkav**[9]=*hin*[10]. Liquid measures include a *hin*, ½ *hin*, ⅓ *hin*, ¼ *hin*, a *log* (also a dry measure), ½ *log*, ¼ *log*, ⅛ *log* & an ⅛ of an ⅛ of a *log* which is a *kortov*[13] (liquid). **Issaron**[14] (dry measure of flour)=**Omer** (dry) measure of grain[16]. **Kav** (dry,liquid) is the basic unit from which others are derived. **Kabayim**[17] (dry)=2 *kav*. **Kepiza**[18] (dry) is the min. measure required for taking Challah. **Kikar** (loaf)=⅓ *kav*. **P'ras**[20] (½ loaf[21]) or **Perusah** (broken loaf)=⅙ *kav* =[23] 4 *betzim*. **Seudah**=⅓ *kav*[24]. Two **Seudot**[20]=6-8[25] *betzim*[26] (dry)=[52]18 **Grogeret=M'lo Hayad** (a handful) of hops or **M'lo Uzilta D'Ikarei** (full bundle) of green grain[28] or 2 **Shargushei** (spoonfuls) of Shesisa[29]. **Log** (dry,liquid) =**Rova** (dry)=[32]**Old Tomnata**=[33]Tzipporean **Kasta** (dry)=[34]**Litra=Tarta**[35]. **Revi'it**, a common measure of liquids & also known as **Anpate, Anbag** and **Antal**[36]=vol. of 2 x 2 x 2.7 *etzba'ot*[8] or 2 x 2 x 1⅖ *etzba'ot*[39]. This is not identical to a *rova* (a dry measure). ½ **Tiberian Sh'minit** =[32]*revi'it*[40]1½ *beitzim*. **Teitarton**[32] was slightly smaller than a **revi'it**. **Betzah** (egg)[20], the smallest dry measure regularly used=the vol. of 2 x 2 x 1 *etzba'ot*. **Tamnita** is Aramaic for **Sh'minit**=[34] **Ukhlah**[42] (dry). **M'lo lugmav**[20] (cheeks full) =42ml (A) is **rov revi'it** (just over ½ *revi'it*)=[44]**M'lo** (or **K'dei**)

												kor[7]	
											letech[12]	5	10[15]
										ephah	2	15[12]	30
									se'ah	3[19]	15[12]	30	
								tarkav	2[22]	6	30	60
							issaron	1⅔	3⅓	10[27]	50	100
						kav[30]	1⅘	3[22,51]	6[19]	18	90	180
					kepiza	1⅓	2⅖	4	8	24	120	240
				log[37]	3	4[19]	7⅕	12[58]	24	72	360	720
			tomen	2	6	8	14⅖	24	48	96	720	1440
		revi'it[20]	2	4	12	16	28⅘	48	96	288	1440	2880
	betzah	1½[44-Rashi]	3	6[19,41]	18	24	43⅕	72	144	432	2160	4320
shminit	1⅓	2	4	8[34]	24	32[15]	57⅗	96	192	576	2880	5760
kezayit	1½	2	3	6	12	36	48	86⅖	144	288	864	4320	8640
mesurah	3	4½	6	9	18	36[43]	108	144	259⅕	432	864	2592	12,960	25,920
kortov	1⅞	5⅓	8	10⅔	16	32	64	192	256	460⅘	768	1536	4608	23,040	46,080

							Betzah			144			
Desert	A. Na'eh	5.4ml	9.6ml	17.3-28.8[45]	43.2ml	57.6ml	86.4ml	172.8	345.6	1.04L	1.38	2.49L	4.1L	8.29L	24.9L	124.4L	248.8
	B. Hazon Ish	9.3ml	16.6ml	33-49.8[45]	74.6ml	99.5ml	149.3ml	298.5	597.0	1.79L	2.39	4.30L	7.2L	14.33	43.0L	214.9L	429.9
								Betzah			172.8			
Jerusalem	A. Na'eh	6.5ml	11.5ml	34.6ml	51.8ml	69.1ml	103.7ml	207.3	414.6	1.24L	1.66	2.98L	5.0L	9.95L	29.9L	149.3L	298.5
	B. Hazon Ish	11.2ml	19.9ml	59.7ml	89.6ml	119.4	179.1ml	358.2	716.4	2.15L	2.87	5.16L	8.6L	17.19	51.6L	257.9L	515.8
								Betzah			207.4			
Tzipori	A. Na'eh	7.8ml	13.8ml	41.5ml	62.2ml	82.9ml	124.4ml	248.7	497.4	1.49L	1.99	3.58L	6.0L	11.94	35.8L	179.1L	358.1
	B. Hazon Ish	13.4ml	23.9ml	71.7ml	107.5ml	143.3	215.0ml	429.9	859.8	2.58L	3.44	6.19L	10.3L	20.64	61.9L	309.5L	619.0

gemi'ah[32,46] (a swallowful)>[44] **Grogeret. Kezayit** (vol. of an olive) is somewhere between <⅓ *betzah*[47] & ½ *betzah*[48], ie 15-50 ml. **Kotevet**[20,49] (large date)=2 *zeitim*[50] or > *zayit* & < *beitzah*[51]=30ml (A). **Grogeret**[20] (dry fig)=⅓ *seudah*[52] or ¹⁄₈₁ *kav*. Other volumes include **K'adashah**[128] (lentil), **Se'orah**[53] (barley), **Pol Halavan** (white bean)[54], **m'lo egrof**[55] (fistful) & **Poteach Tefach. M'lo Tarvad**[56] (ladleful) is arguably equivalent to **M'lo Pisat Hayad**[57] (palmful) or **M'lo Chofnav**[58] (2 handsful), and is larger than **M'lo Kumtzo**[59] (**kometz**[59,60]) which is 3 fingers full[61]. There were 3 separate systems, in order of both date of origin & size: (1) desert (*midbar*), the measures used in the years in the Sinai with Moses; (2) Jerusalem (*Yerushalmit*); & (3) Tzipori (*Tzipporit*). Yerushalmit measures are ⅕ larger than those of *midbar*, and the *Tzipporit* measures ⅕ larger than *Yeushalmit*[62]. "If it was the desert *se'ah* it should have contained 144 eggs, and if it was the Jerusalem *se'ah* it should have contained 173 eggs, and if again it was the one of Tzipporit it should have contained 207 eggs"[63]. 1 *midbar seah*=5 *Yerushalmit kav*[64]. 5 *Yerushalmit se'ah*=6 *midbar se'ah*=2 *midbar ephah*[65]. 10 *Yerushalmit kav*=6⅔ *issaron*=⅔ of 10 *midbar issaron*[66]. **Kista** (liquid) is volume of wine[67].

Length

Mahalach (**Derech**[68]) **Yom** (a day's walk) from dawn until it is completely dark[69]. **Parsah**[70] (Persian mile or parasang). **Kimlo regel behemah**=[71]16 *mil*. **Mil** (Talmudic mile) related but not identical to Roman mile, is also known as **Techum Shabbat.Ris**=the length of the Greek stadium. **M'lo ma'anah** =[77]100 *amot*. **Iburah**=70⅔ *amot*[79]. **Kaneh**[80] (reed) is a measure.

	mahalach yom				
parsah	10[72]				
mil[73]	4[74]	40			
ris	7½[75]	30	300		
kaneh	30[76]	225	900	9000	
amah	6[78]	180	1350	5400	54000
zeret[81]	2[82]	12	360	2700	10800	108000
tefach[83]	3	6[84]	36	1080	8100	32400	324000
etzba[85]	4[99,100]	12	24	144	4320	32400	129600	1296000
A	1.9cm	7.62cm	22.86c	45.7c	2.74m	122m	914m	3.66km	36.58km
B	2.405cm	9.62cm*	28.86c	57.7c	3.46m	154m	1.17km	4.62km	46.176km
C	2.249cm	8.996cm	27.99c	54c*	3.24m	146m	1.09km	4.39km	43.68km

for buildings. **Chevel**[86] (rope)=[87]50 *amot*. **Amah**[88] (cubit), dist. from elbow to middle finger=**Gomed**[89]=**Garmida**[90]. **Short amah**=[91]5 *tefachim*. **Pesiah beinonit** (regular step)=[92]*amah* but **Pesiah gasah**[92,93] >1 *amah*. **Zeret** (little finger span), dist. bet'n thumb & end of little finger=2 or 3 *tefachim*. **Kizba**=[94]2 *tefachim*. **Tefach/Pushach**[95] (handbreadth), the width of a clenched fist (*otzev*)=**Sit** (used for measuring pieces of fabric), dist. b/n index & middle finger[96] when held as far apart as possible=4 *gudal* (or **agudal**, thumb breadths)=**k'dei anivah**[97]. **Tefach sochek**[98] (loose)=4.08 *etzbaot*. **Etzba** or **M'lo Etzba**[99] (fingerbreadth) is the basic unit, typically the width of the middle of the thumb (*gudal*[105] or *agudal*), but can be the width of the middle finger, *tilta*, (⅕ *tefach*) or small finger, *ketanah*, (⅙ *tefach*)[100]. **Kesher agudal**[101] (thumb-joint) is 3.5-4cm (A & B). **Orech se'orah** (barleycorn length)=1.0cm (A) or 1.07cm (B) is width of tefilin straps[102]. **M'lo charshinah**[103] (size of vetch)=[104]⅓ *orech se'orah*. **M'lo chut hasa'arah**[105]/ *nima*[106] (hairsbreadth) is smallest measure.

Time

Yovel (Jubilee) is the 50th yr. **Shmittah** (Sabbatical year) is every 7th yr[108]. **Shanah** (yr) is typically 354 days (i.e. 12 lunar cycles of 29½ days) but may also have 353 or 355 days in a regular yr &, given that 7 yrs in 19 is a leap yr with an extra mth, may have 383, 384 or 385 days per leap yr[109]. **Tekufah** (circuit) may refer to the vernal equinox, the summer solstice, the fall equinox or the

							yovel[107]	
						shmittah	7½	
					shanah	7	50	
				tekufah	4	28	200	
			chodesh	3	12.368	86.579	618.4	
		shavua	4.214	12.642	50.568	354	2528.6	
	yom	7	29.5	88.5	354	2478	17700	
onah	2	14	59	177	708	4956	35400	
sha'ah	12	24	168	708	2124	8495	59468	424771
chelek	1080	12960	25920	181440	764588			
et	0.533	576	6912	13824	96768	407780		
rega[114]	24	12.8	13824		7 days			

winter solstice. **Chodesh** (mth) is approx. 29½ days, so months typically alternate between 29 (**Chodesh Chaser**) & 30 (**Chodesh Maleh**) days. **Shavua** (week) is also sometimes referred to as **Shabbat**[110]. **Yom** (mostly day but sometimes yr[111]) of 24-hr period or referring just to daylight. Days are typically measured from night-time to night-time. **Me'et l'et** (from one time to the next) is used to refer to a 24-hr period. **Onah** (period), often referring to a ½ day period either daytime or night-time[112], is also used to denote ¹⁄₂₄ of an *et* (i.e. 2½ min). **Sha'ah** (hr) is either **Sha'ah Regilah** (regular hr i.e. 60 min) or **Sha'ah Zemanit** (proportional hr) where the daylight period (sunrise to sunset) is equally divided by 12 & these units are sometimes less & sometimes>60 min. **Et** (time)=[113]½ *onah* (in this sense, an hr) or 6¼ sec. **Rega** (moment)=¹⁄₅₃₈₄₈ hr[114] or ¹⁄₅₈₈₈₈ hr[115] or an undefined, momentary period but mostly used to denote ¹⁄₂₄ of an *et*. Other units include **Hiluch Mil** (the time taken to walk 2000 cubits) =18[116]-24 min, **Kdei Achilat P'ras**[117] (time taken to eat ½ loaf of bread) varying between 2 and 9 min., and **Toch K'dei Dibur** (the time it takes to say *shalom aleichem rebi*[118]). **M'lo Nima**[119] (hairsbreadth) and **K'heref Ayin**[120] (blink of an eye) are the smallest amount of time. See *Pes.*94a for discussion on time taken to travel a specified distance (1 *mil* may be travelled in 22.5-24 min)

[1]*Lev.*27:16,*Isa.*5:10,*Ezek.*45:11,13,14,*Hos.*3:2; [2]*Rashi Adriv L'areivah* (*B.M.*80b); [3]*Ex.*16:36,*Lev.*5:11,6:13,20,19:36,*Num.*5:15,28:5,*Jud.*6:19,*I Sam.*1:24;17:17,*Isa.*5:10,*Ezek.*45:10,11,13,24;46:5,7,11,14,*Amos* 8:5, *Zach.*5:6-10,*Ruth* 2:17,*Ezra* 7:22; [4]*Ezek.*45:11; [5]*I Kings* 7:26,38,*II Chr* 2:9,10,4:5,*Ezek.*7:22,45:10,11,14,*Isa.*5:10; [6]*Gen.*18:6,*I Sam.*25:18, *I Kings* 18:32,*II Kings* 7:1,16,18; [7]*I Kings* 5:2,23,*Ezek.*45:14,*II Chr.*2:9,27:5; [8]*Pes.*109b; [9]*Nid.*49b; [10]*Ex.*29:40,30:24,*Lev.*19:36,23:13, *Num.*15:4,5,6,7, 9,10,28:5,7,14,*Ezek.*4:11,45:24,46:5,7,11,14; [11]*Hos.*3:2, *Rashi* *B.M.*80b; [12]*Rashi Shab.*127a; [13]*R.Sh.*13a,*Ket.*104a,*B.B.*90a, *Makk.*4a,*Hul.*26a; [14]*Ex.*29:40,*Lev.*6:20,14:10,21,23:13,17,24:5,*Num.*15: 4,6,9,28:9,12,13,20,21,28,29,29:3,4,9,10,14,15,*Ezek.*45:11; [15]**Chomer**=10 **Bat**=10 **Ephah** (*Ezek.*45:11,14); [16]*Ex.*16:16,18,22,32,33,36; [17]*Shab.* 140a,156a,*Yom.*44b,*B.K.*20a,58b,*B.M.*21a,*B.B.*90a,*Tam.*30b; [18]*Pes.*48b; [19]*Rashi Ex.*16:36; [20]*Me'il.*17b; [21]*Bek.*58a; [22]*Rashi Arak.*25a; [23] *Rashi A.Z.*67a; [24]*Erub.*82b & *Rashi chetzyah l'vet hamenuga*; [25]*Rashi p'ras* (*Pes.*44a) [26]*SA OC* 368:3,*MB* there; [27]**Omer**-*Ex.*16:36; [28] *Erub.*28b;[29]*Erub.*29b; [30]*II Kings* 6:25; [31]*RaSHBaM* "*vachatzi se'ah*", *Shab.*59a,*Sot.*8b,*B.B.*89b; [32]*Shek.*8b; [33]*Pes.*109a; [34]*Rashi uklhah* (*Erub.*29a); [35]*Hul.*124a; [36]*B.B.*58a; [37]*Lev.*14:10,12,15,21,24; [38] **Hin**=12 **Log** (*Men.*89a); [39]*Shek.*9a; [40]*MB* 271:68; [41]*RaSHBaM* "*Tomen*" (*B.B.*89b); [42]½ *kav* according to *RaSHBaM* & *Rashi* (*Pes.*109a); [43]*Mesurah* (liquid)=¹⁄₃₆ *log* (*B.B.*89b); [44]*Tosefot Shab.*76b; [45]The

smaller measure used for Rabbinic obligations, larger measure for Biblical obligations; [46]*Yom.*8a; [47]*OC* 368:3; [48]*OC* 468:1; [49]*Ber.*41b,*Erub.*4b,*Yom.*73b, 78b-80a, *Suk.*6a; [50]*Ker.*14a; [51]*Yom.*79b; [52]*Erub.*80b; [53]*Bek.*45a; [54] *Ber.*36b,*Bek.*40b; [55]*Kel.*17:12; [56]*Tem.*31a,*Nidd.*27a-b; [57]*Naz.*50b; [58]*Erub.* 9:8,*Lev.*16:12,*Ecc.*4:6,see *machloket in Naz.*50b; [59]*Lev.*2:2,5:12; [60]*Gen.*41:47, *Lev.*6:8; [61]*Erub.*28b,*Yom.*47a-b,*Men.*11a; [62]*Sheb.*15a; [63]*Erub.*83a; [64]*Yom.* 44b; [65]*Men.*76b; [66]*Men.*78a; [67]*A.Z.*30a,34b; [68]*Yotzer l'Parashat Shekalim*; [69]*Pes.*93b; [70]*Ber.*15a,23a,30a; [71]*Bek.*54b; [72]*Rashi Num.*13:25; [73]*Ber.*16a,62a,*Shab.*34b-35b,*Pes.*46a; [74]*Rashi Ber.*63b; [75]*Yom.*67a,*B.M.* 33a; [76]*Rashi Gen.*14:17; [77]*Tem.*13a; [78]*Ezek.*41:8; [79]*Erub.*30b; [80]*Ezek.* 40:5,7; [81]*Ex.*28:16,39:9,*I Sam.*17:4,*Isa.*40:12,*Ezek.*43:13; [82]*RaSHBaM Ex.* 28:16; [83]*Ex.*25:25,37:12,*I Kings* 7:9,26,*Ezek.*40:5,43,43:13,*Ps.*39:6,*II Chr.*4:5; [84]*Erub.*3b,*Men.*97a; [85]*Jerem.*52:21; [86]*II Sam.*8:2; [87]*Koh.Rab.*9:13,*Rashi Erub.* 52b; [88]*Gen.*6:15,16,7:20,*Ex.*25:10,17,23,26:2,8,13,16,27:1,9,12-14,16, 18,30:2,36:9,15,21,37:1,6,10,18,25,38:9,11-15,18,*Num.*11:31,35:4,5,*Deut.*3:11, *Josh.*3:4,*I Sam.*17:4,*II Sam.*8:1,*I Kings* 6:2,*I Kings* 3,10,16,17,20,23-26,7:2,6,10, 15,16,19,23,24,27,31,32,35,38,*II Kings* 14:13,25:17,*Jerem.*51:13,52:21,22,*Ezek.* 40:5,7,9,11-15,19,21,23,25,27,29,30,33,36,42,47,48,49,41:1-5,8,9-15,22,42:2, 4,7,8,43:13-15,17,45:2,47:3,*Zech.*5:2,*Neh.*3:13,*Isa.*6:4,*Esther* 5:14,7:9,*I Chr.*11: 23,*II Chr.*3:3,11,12,15,4:1,2,3,8,11,13,6:13,2,25:23; [89]*Judges* 3:16,*B.B.*100a;

Area

Area Bet Kor is the min. space necessary to sow one *kor* (see Vol.) of produce. **Bet Se'ah** is the min. space necessary to sow one *se'ah* (see Vol.) of produce. **Bet Satayim** is twice this amount & there is an argument if this is 50x 100 **amot** or a square of 70⅔ **amot**[121]. **M'lo Ma'anah** (100 *amot*) (see Length) sq'd =[123]4 or 5 *bet seah adasha*

unit								
bet kor								
bet seah	30							
bet kav	6	180						
bet rova	4	24	720					
amah m.	104 1/6	416⅔	2500[122]	75000				
tefach m.	36	3750	15000	90000				
etzba m.	16	576	60000					
gris	1 15/64	19¾	711½	74062½				
adasha	9[135]	11⅛	177¾	6400	666562½			
A	0.361	3.25	4cm²	64cm²	2304cm²	24m²	96m²	576m² 17280
B	0.526	4.73	5.8cm²	92.2cm²	3318cm²	34.9m²	138m²	830m² 24900
C	0.468	4.21	5.2cm²	83cm²	2981cm²	31.1m²	124m²	745m² 22358

Bet Kav is min. space requ'd to sow one *kav* (see Vol.) of produce. **Bet Rova** is min. space requ'd to sow ¼ *kav* (see Vol.) of produce. **Amah Meruba'at** (sq.cubit). **Tefach Meruba** (sq.handbreadth). **Etzba Meruba'at** (sq.fingerbreadth) used primarily for measuring small pieces of fabric (in order to decide whether they are susceptible to ritual impurity). **Tzemed**[124] (yoke), an ancient Hebrew unit of land area (0.2 hectare or around ½ acre), is also translated "acre" or ½ acre[125]. **Chomer**[126], a unit of land area about 2.4 hectares (6 acres), was the amount of land that could be planted with 1 **chomer** (see Vol.) of seed. It is also a unit of dry capacity, about 230 litres (6.5 bushels)[127]. Many common objects became the source of a measurement of area. So, **M'lo egrof**[128,130] (size of a fist), **M'lo makde'akh gadol**[129] (size of the large Temple auger)=[130]size of **Pundyon** coin (Italian dupondium)=[130]size of a **Neronian Sela**=[130]size of the hole of a yolk. Size of a **Sela**[131]=size of **grogeret**[132] but smaller than an ordinary **M'lo Makdeakh**[133]. **K'turmus** (lupine bean) was larger than[131] a **Gris**[134,136] (split bean's area), which could grow 36 hairs on it[135]. **Adashah**[136] (a lentil's area)=[135]area of 2 **Sa'arot** (hairbreadths – the space between 2 adjacent hairs) x 2 **Sa'arot**. **M'lo pi hazug** (scissors tipful)=2 hairs[136]. **K'chardal**[137] (size of a mustard seed).

Weight

Weight These are very closely related to the coins (see Coins) The different units of weight varied from place to place; thus the **Judean Sela** weighed twice as much as the **Galilean Sela**[139]. Two main conversions were done to our current weights and both are given oppos.

unit								
kikar								
maneh	60							
tartimar	2[138]	120						
unkeya	6¼	12½	750					
B.shekel	2[140]	12½	25	1500				
T.shekel	2[141]	4	25	50	3000			
pim[142]	1½	3	6	37½	75	4500		
dinar	1⅓	2	4[140]	8	50	100	6000	
	450mg	4½g	6g	9g	18g	36g	72g	450g 27kg
	571mg	5.71g	7.61g	11.42g	22.84g	45.68g	91.36g	571g 34.26kg

A **Kikar shel kodesh**=2 common **Kikar**[141]. **Kikar** the weight of a silver *kikar* known as "talent"[143]. A **Maneh shel kodesh**=[141]2 common **Maneh**. **Maneh**[144]=**Maneh Italki**=Litra[145]=60 Shekel[146]. **Biblical Shekel**[147]=Sela (as known in the Mishnah), the weight of the strip of red wool of the he-goat. That of the *parah adumah* weighed 2 or 2½ **Selaim**[148]. ½ **Biblical Shekel**=**Beka**[149] was the weight of the strip of red wool of the *metzora*[148]. Weights representing more than 1 *Shekel* tend to occur in multiples of 4, such as 4, 8, 12, 16, 24 and 40 *Shekels*. The explanation[150] appears to be that 4 *Shekels* were very close in value to 5 Egyptian qdt, so a balance weight of, say, 12 shekels could be understood by an Egyptian trader as 15 qdt, and by a Judean as 12 shekels. **Pim**, an ancient Hebrew unit of weight. A **Dinar** or **Zuz**[148,151], about 5.7g (88.1grains)=½ **Shekel**[149,152]. **Gomed**, in the Assyrian "light" system of units of mass, was about 502g (½ as much in the heavy system). Names of coins were used as weights. The lowest was **Perutah**=0.022g & a **Se'orah** (grain) weighed twice as much.

Metric to non-metric conversion

Area: 1 cm²=0.15500031000062in² or 0.0010763910416671 ft²; 1 m²= 10.76391041670972 ft² or 1.19599004630108 yd²

Length: 1cm=0.393700787402in; 1m=39.37007874in=3.2808398950ft; 1km=3280.839895013ft or 1093.613298338yd or 0.6213711922373mi.

Volume: 1 mL=0.033814023fl oz; 1L=33.8140227 fl oz, 0.26417205 gal

Weight: 1 g=0.0352739619495804 oz; 1 kg=2.204622621848776 lb

Red denotes measurements of one parameter which relate to another.

[90]*Pes.*111b; [91]*Erub.*3b-4a,*Men.*97a; [92]*Shab.*113b; [93]*Ber.*6b,43b, *Ta'an.*10b; [94]*Rashi Men.*69b; [95]*Sukk.*5b,*B.B.*3a,14b; [96]*Rashi Shab.* 79a,105b,*Tem.*34a; [97]*OC* 12:1; [98]*Sukk.*7a; [99]*Bek.*39b; [100]*Men.* 41b; [101]*Men.*42a; [102]*KSA* 10:13; [103]*Bek.*37a; [104]*Rosh borech* (*Oha.* 17:1); [105]*Men.*30a; [106]*Erub.*76b,*Ta'an.*9b,*Hag.*15a; [107]*Lev.*25:10- 12; [108]see *A.Z.*9b on when counting starts; [109]see *Arak.*31b; [110]*Lev.* 23:16; [111]*Gen.*21:34,37:34,*Deut.*1:46; [112]*Nid.*65a; [113]*Tosefta Ber.*1:3; [114]*A.Z.*4a; [115]*Ber.*7a; [116]*OC* 459:2,*MB* 459:15; [117]*Ber.* 37b,41a,*Erub.*4a,*Pes.*44a,*Yom.*80b, *Sukk.*6a, 42b,*Nez.*36b-37a,*Zeb.*70a,*Men.* 75b, *Hul.*35a,71b,*Ker.*12b-13b,*Neg.*13:9-10; [118]*Sheb.*32a; [119]*Shab.*30a, *Yom.*38b,*Ta'an.*5b, *M.K.* 28a; [120]*Ber.*2b,*Shab.*34b; [121]*Erub.*23a; [122] *Erub.*23b; [123]*Nid.*57a; [124]*Isa.*5:10; [125]*1 Sam.*14:14; [126]*Lev.*27:16; [127]*Ezek.* 45:14 defines the unit. *Num.*11:32,*Isa.*5:10,*Ezek.*45:11,13,14, *Hos.*3:2. "measure" (*I Kings* 18:32); [128]*Oha.*13:1,*Sukk.*21a,*Nid.*43b; [129]*Kel.*17:12,*Oha.*13:1-3,14:2,*Erub.*7a,*Hul.*45a; [130]*Bek.*37b; [131] *Nid.*58b; [132]*Shab.*78b; [133]*Bek.*38a; [134]*Bek.*34b,*Nid.*14b,52b; [135] *Neg.*6:1; [136]*Makk.*20b; [137]*Nid.*66a; [138]*Sanh.*70a; [139]*Rashi Ket.*59a; [140]*Rashi Ex.*21:32; [141]*Men.*77a,*Bek.* 5a; [142]*1 Sam.*13:21; [143]*II Kings* 18:14; [144]*I Kings* 10:17; [145]*Bek.*31a; [146]*Ezek.*45:12; [147]*I Sam.*17:5,7; [148]*Shek.*10a; [149]*Gen.*24:22; [150]Raz Kletter, "Economic Keystones. The Weight System of the Kingdom of Judah" in *Journal for the Study of the Old Testament*, Supplement Ser.#276.Sheffield,England: Sheffield Academic Press,1998; [151]*Yom.* 34b; [152]*Ex.*38:24-26,*Rashi* 38:26; [153] *Pes.*11b; [154]*Kidd.*11a,*Bek.*50b; [155]*Bek.*11a; [156]*Rashi Bek.*48b; [157] *B.M.*44a,45b; [158]*BB.*105b; [159]*B.M.*52a; [160]*Bek.*50a,*Arak.*24b; [161] *B.M.*44b; [162]*Kidd.*12a; [163]*Ezra* 2:69,*Nehem.*7:70-72; [164]*Arak.*7b; [165]*Num.*18:16; [166]*Ex.*30:13,*Lev.*27:25,*Num.*3:47,18:16,*Ezek.*45:12;

Coinage

Coinage R' Steinsaltz writes that the currency systems in the Talmudic period were the most complicated elements of weights and measures mentioned in the Talmud. All those factors that produced differing standards of length, area and volume were combined in the area of coinage. In the nature of things, legal tender passes from one country to another, so that there has to be some correlation between the monetary systems of different countries. Moreover, *Eretz Yisrael*, which was an international crossroads, and to which contributions from Jews all over the world were sent, was full of extreme diverse types of currency. Two different coinage systems were used by the Jews[153]:(1) "Tyrian money" (largely equivalent to the coins mentioned in the Torah[154]), and according to which those values mentioned in the Torah were calculated, & (2) "money of the state"

unit													
kikar													
kodesh													
kikar	2												
maneh	60	120											
shel	see *Ex.*38:25,												
kodesh	*Rashi* 38:24												
maneh	2	120	240										
dinar zahav	4	8	480	960									
sela	3⅛	12½	25	1500	3000								
rigya	¾	4 11/16	18¾	37½	2250	4500							
dinar	2	3[155]	4[156]	25[157]	50	100	6000	12000					
istera	2[172]	4	6	8	50	100[158]	200		24000				
ma'ah	3	6[162]	12	18	24	150	300	600	72000				
pundyon	2[162]	6	12[159]	24	36	48[159]	300	600	1200	=1/48 *sela*[160]			
issar	2[162]	4	12	24[161]	48	72	96	600	1200	2400			
mesimas	2[162]	4	8	24	48	96	144	192	1200	2400	4800		
kontrank	2[162]	4	8	16	48	96	192	288	384	2400	4800	9600	
perutah	2[162]	4	8[162]	16	32	96	192	384	576	768	4800	9600	19200

768 **perutahs**=1 **Biblical Shekel**[162] or **Sela**. **Perutah**=19g (Na'eh) or 11.3g (Hazon Ish) silver

with the same names as those in Tyrian money, but whose value=[154]⅛ of corresponding coins in the Tyrian money. Most payments specified by the Mishnah and Talmud are reckoned according to the "sela of the state"[154], reflecting the latter system. As with other measures, there was a systematic change of 20% in the larger coins during the Second Temple period. **Maneh**[163]. 1 *Sela*=2 *Talmudic Shekel*=[164]1 **Shekel Hakodesh** (so called because it was used for payments made to the Sanctuary)=[165]20 **Gerah**[166]. **Beka**[167]=½ **Shekel**. During 2nd Temple period, **Shekel Hakodesh** was revalued to 24 **Gerah** & all coins larger than 1 **Gerah** were revalued accordingly. All payments required by the Torah to be made in units of **Shekel Hakodesh** were thenceforth to be made in units of **Sela**, thus increasing the amounts involved by ⅕. **Garmesin**=⅟₁₂ **Shekel Hakodesh**[168]. **Darkon**[168]=Dinar. **Gold Darkon**[169]=**Darkamon**[163]=2 **Selaim**. **Dinar Zahav**[170] (of gold) resembled the silver **Dinar**. **Taba'ah** (*Teva'in*)[168]=½ **Sela**. **Dinar**, also known as **Kesef**[171] in Tyrian currency[172]=**Zuz**=**Luma**[173]=**Zin**=**Keratin**[168]=¼ **Sela**. **Tarpe'ik**[174]=**Istera**. **Ma'ah**, a silver coin=**Gerah**[176]=**Kesitah**[177]=**Danka**[155,178] with a weight of 16 barleycorns of silver (384mg). **Perutah**, (weighing ½ barleycorn)=[162]⅛ **Italian Issar**[180]=**Kurdinian gold dinar**[181]. **Sha'veh Perutah** (value of a **Perutah**) is either based on current price of silver (see red writing above) or ⅟₃₈₄₀₀ of the min. required to live for a yr (i.e. 768 x 200 zuz)[182]. **Agorah**[183] was a small coin. **Adarkon**[184] was a Persian gold coin.

[167]*Ex.*38:26; [168]*Shek.*6a,*Bek.*51a; [169]*Shek.*5a; [170]*Erub.*19a,*Pes.*57a,*Hag.*27a, *Naz.*31a-b,*B.K.*36a-b,62a,*B.M.*48a,49a; [171]*Gen.*37:28; [172]*Istera=½ Zuz* (*Kidd.* 11b); [173]*Rashi A.Z.*34b; [174]*Yom.*35b,*Ket.*64a; [175]*Gitt.*45b; [176]*Ex.*30:13; [177]*Gen.*33:19,*Josh.*24:32,*Job* 42:11; [178]*R.Sh.*26a,*Ker.*22b; [179]*B.M.*46a,*Sheb.*40a; [180]*Kidd.*21a; [181]*Hul.*54b; [182]*Peah* 8:8; [183]*I Sam.*2:36; [184]*I Chr.*29:7,*Ezra* 8:27

Glossary / Index

term	code	term	code	term	code	term	code
achilat p'ras	time	dupondium	c	k'heref ayin	t	mil	l
acre	area	egg	v	kikar	c,v,w	mile, persian	l
adarkon	coin	ephah	v	shel kodesh	c,w	shekel (im)	c,w
adashah	a	equinox	t	kista	v	Biblical	c,w
adriv	volume	et (itim)	t	kizba	l	hakodesh	c
agorah	c	etzba (ot)	l,v	kometz (im)	v	talmudic	l
agudal	length	meruba'at	a	kontrank	v	moment	l
amah (amot)	l,v	fig	v	kor	a,v	month	l
meruba'at	a	fingerbrdths	a,l,v	kortov	v	sh'minit	t
anbag	v	fist	l	kotevet	v	mustard seed	a
anpate	v	garmesin	c	k'turmus	a	shmittah	t
antal	v	garmida	c	kurdikinian	c	neronian sela	a
arbaim se'ah	v	gerah	w	lentil	a,v	olive	v
barley	v	gomed	l,w	letech	v	omer	v
barleycorns	c	gris	a	litra	v,w	sit	l
bat	v	grogeret	v	log	v	solstice	t
bean, lupine	a	gudal	l	luma	c	spoonful	v
split	a	handbreadth	a,l	ma'ah	c	sunrise	t
white	v	handful	v	mahalach yom.	l	sunset	t
beka	c,weight	hairbreadth	a,l,t	maneh	c,w	tabaah (tevain)	c
bet kav	a	hectare	a	me'et l'et	t	talent	w
kor	a	hiluch mil	t	m'lo charshina.	l	tamnita	v
rova	a	hin	v	chofnav	v	tarkav	v
satayim	a	iburah	v	chut hasa'ara.	l	tarta	v
seah	a	issar	c	egrof	a,v	tarpe'ik	c
betzah	v	issaron	v	gemiah	v	tartimar	w
bread	t	istera	c	rega	t	tefach(im)	l
bushels	a	jubilee	t	revi'it	v	teitarton	v
cheeks	v	kabayim	v	rigya	c	tekufah	t
chelek	l	k'adashah	v	ris	v	thumb breadths	l
chevel	l	kaneh	l	rope	l	tilta	l
chodesh	t	kasitah	c	rova	v	toch k'dei dibur	t
chomer	a,v	kasta	c	sa'arot	a	tomen	v
circuit	l	kav	a,v	sabbatical	t	tomnata	v
cubit	a,l,t,w	k'chardal	a	se'ah	a,v	treisit	c
danka/ei	c	kedei anivah	l	sela(im)	c,w	tyrian	c
darkamon	c	kepiza	c	se'orah	v	tzemed	a
darkon	c	keratin	c	seudah (ot)	v	ukhlah	l
date	v	kesef	c	regel behemah.	l	unkeya	w
day	t	kesita	c	tarvad	v	week	t
desert	v	ketanah	l	uzilta d'ikarei	v	year	t
dinar	c,w	kezayit	v	shabbat	t	yom	t
dinar zahav	c			shanah	t	yovel	t
				shargushei	v	zeret	l
				sha've perutah.	c	zin	c
				middle finger	l	zuz	c,w