TABLE 1.5 Antioxidants in the Edible Parts of Date Palm Fruits

Type	TFC	TPC	AA (frap)	TEAC
Honey	1.64	2.72	11.82	23.04
Honey	1.73	2.77	11.96	21.16
Honey	1.82	2.66	10.06	22.50
Sahroon	0.96	4.83	21.08	35.82
Sahroon	0.98	4.85	18.44	35.52
Sahroon	1.63	4.73	18.87	31.88
Bam	1.64	2.23	11.04	19.43
Bam	1.77	2.36	9.66	19.43
Bam	1.96	2.10	10.02	18.00
Jiroft	0.85	1.61	7.87	25.03
Jiroft	0.89	1.62	6.96	11.82
Jiroft	1.04	1.57	7.31	13.48
Piarom	3.03	4.56	22.40	43.41
Piarom	3.29	4.39	21.67	34.60
Piarom	3.90	4.27	19.56	37.64
Kabkab	1.01	2.22	8.52	34.85
Kabkab	1.01	2.34	7.51	24.01
Kabkab	1.25	2.00	7.47	22.26
Zahedi	3.58	3.20	14.63	44.23
Zahedi	4.71	3.32	13.82	36.55
Zahedi	3.36	3.18	13.96	25.80
Kharak	55.98	117.18	329.45	404.14
Kharak	72.31	123.87	328.66	397.57
Kharak	79.58	118.21	326.30	594.71

The distribution is a bell-shaped curve, as illustrated in Fig. 1.1. Fig. 1.1 is generated using R statistical software. The codes for generating normal distribution curve are given in the Appendix.

b. Multivariate normal distribution

The multivariate normal density with mean vector $\boldsymbol{\mu}$ and covariance matrix $\sum$ is given in (1.2).

$$g(Y) = \frac{1}{(2\pi)^{k/2}\left|\sum\right|^{1/2}} e^{-(\boldsymbol{Y}-\boldsymbol{\mu})'\sum^{-1}(\boldsymbol{Y}-\boldsymbol{\mu})/2} \tag{1.2}$$

Where k is the number of variables and $(\boldsymbol{Y}-\boldsymbol{\mu})'\sum^{-1}(\boldsymbol{Y}-\boldsymbol{\mu})$ is the Mahalanobis distance (statistical distance). We denote this k-dimensional normal density by $N_k(\boldsymbol{\mu}, \sum)$.

Note

- Use an appropriate transformation of the data if one or more variables under study violate the normality assumption, as when the data are highly skewed, with several extreme values (high or low), called outliers, or repeated values.