**Table 4.** **Relative Organ Weight (Percent Body Weight) or Tissue Volume for Market-age Sheep with the Average Body Weight as 58.73 kg.**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Mean** | **SD** | | | **Number of Animals** | | | | **Number of Studies** | **References** | |
| Adrenals | 0.006 | | 0.002 | | | 13 | | 2 | | 1, 2 |
| Adipose Tissue | 20.98 | | 2.68 | | | 14 | | 2 | | 3, 4 |
| Blood | 5.06 | | 0.64 | | | 64 | | 5 | | 5-9 |
| Bone | 5.31 | | 0.53 | | | 44 | | 2 | | 4, 10 |
| Brain | 0.21 | | 0.02 | | | 6 | | 1 | | 1 |
| GI Tract | 4.45 | | 0.54 | | | 23 | | 3 | | 5, 8, 11 |
| Stomach | 2.17 | | 0.42 | | | 10 | | 1 | | 12 |
| Rumen | 1.27 | | 0.18 | | | 14 | | 1 | | 11 |
| Reticulum | 0.28 | | 0.04 | | | 14 | | 1 | | 11 |
| Omasum | 0.26 | | 0.05 | | | 14 | | 1 | | 11 |
| Abomasum | 0.43 | | 0.14 | | | 22 | | 2 | | 8, 11 |
| Small Intestine | 1.28 | | 0.22 | | | 32 | | 3 | | 8, 11, 12 |
| Large Intestine | 0.92 | | 0.14 | | | 32 | | 3 | | 8, 11, 12 |
| Heart | 0.38 | | 0.07 | | | 46 | | 5 | | 1, 6, 8-10 |
| Kidneys | 0.23 | | 0.03 | | | 47 | | 6 | | 1, 5, 6, 8, 11, 12 |
| Liver | 1.27 | | 0.24 | | | 54 | | 8 | | 1, 2, 5, 6-8, 11, 12 |
| Lungs | 1.07 | | 0.24 | | | 46 | | 5 | | 1, 6, 8, 11, 12 |
| Pancreas | 0.10 | | 0.02 | | | 7 | | 2 | | 1, 5 |
| Pituitary | 0.0018 | | 0.0004 | | | 13 | | 2 | | 1, 2 |
| Spleen | 0.28 | | 0.10 | | | 23 | | 4 | | 1, 5, 6, 8 |
| Thyroid | 0.008 | | 0.000 | | | 6 | | 1 | | 1 |
| Uterus (female) | 3.52 | | 1.05 | | | 7 | | 1 | | 2 |
| Udder (female) | 0.57 | | 0.22 | | | 5 | | 1 | | 13 |
| Rest of Body | 56.55 | |  |  | | |  |  | | |

Note: The studies involved in the tissue volume calculations are 1. Moss et al. (2005); 2. Vonnahme et al. (2003); 3. Gregory, Christopherson, & Lister (1986); 4. Butterfield & Thompson (1983); 5. Macgregor & Gerrard (1980); 6. Hansard (1956); 7. Davison, McEntee, & Wright (1965); 8. Kamalzadeh, Koops, van Bruchem, Tamminga, & Zwart (1998); 9. Anosa & Isoun (1976); 10. Perry et al. (1992); 11. McLeod & Baldwin (2000); 12. Rompala, Hoagland, & Meister (1988); 13. Tompson (1980).

**Table 5. Relative Organ Weight (Percent Body Weight) or Tissue Volume for Lambs with the Average Body Weight as 28.34 kg.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Mean** | **SD** | **Number of Animals** | **Number of Studies** | **References** |
| Adrenals | 0.008 | 0.002 | 24 | 2 | 1, 2 |
| Adipose Tissue | 17.67 | 2.48 | 154 | 3 | 3, 5, 12 |
| Blood | 5.29 | 0.54 | 103 | 3 | 6-8 |
| Bone | 6.64 | 0.48 | 43 | 2 | 5,9 |
| Brain | 0.28 | 0.03 | 15 | 1 | 2 |
| GI Tract | 5.08 | 1.42 | 34 | 2 | 8,10 |
| Stomach | 3.09 | 0.94 | 16 | 1 | 11 |
| Rumen | 0.99 | 0.25 | 29 | 2 | 2, 10 |
| Reticulum | 0.24 | 0.05 | 29 | 2 | 2, 10 |
| Omasum | 0.21 | 0.06 | 38 | 3 | 1, 2, 10 |
| Abomasum | 0.42 | 0.14 | 58 | 4 | 1, 2, 8, 10 |
| Small Intestine | 2.36 | 0.45 | 88 | 4 | 4,8,10,11 |
| Doudenum | 0.09 | 0.03 | 9 | 1 | 1 |
| Ileum | 0.16 | 0.09 | 9 | 1 | 1 |
| Jejunum | 0.56 | 0.09 | 9 | 1 | 1 |
| Large Intestine | 1.24 | 0.30 | 88 | 4 | 4,8,10,11 |
| Heart | 0.44 | 0.09 | 100 | 6 | 1,2,4,6,8,10 |
| Kidneys | 0.31 | 0.06 | 118 | 7 | 1,2,4,6,8,10,11 |
| Liver | 1.77 | 0.24 | 195 | 8 | 1,2,4,6-8,10,11 |
| Lungs | 1.91 | 0.21 | 155 | 5 | 4, 6-8,10 |
| Muscle | 24.78 | 2.20 | 43 | 2 | 5,9 |
| Skin | 9.40 | 0.77 | 38 | 1 | 4 |
| Pancreas | 0.10 | 0.02 | 24 | 2 | 1,2 |
| Pituitary | 0.0015 | 0.0003 | 15 | 1 | 2 |
| Spleen | 0.32 | 0.15 | 50 | 4 | 1,2,6,8 |
| Thyroid | 0.010 | 0.002 | 15 | 1 | 2 |
| Rest of Body | 25.99 |  |  |  |  |

Note: The studies involved in the tissue volume calculations are 1. Barnes, Comline, & Dobson (1983); 2. Hales & Fawcett (1993); 3. Gregory, Christopherson, & Lister (1986); 4. Joy, Ripoll, & Delfa (2008); 5. Murray & Slezacek (1976); 6. Hansard (1956); 7. Riley, Savell, Shelton, & Smith (1989); 8. Kamalzadeh, Koops, van Bruchem, Tamminga, & Zwart (1998); 9. Elsley, McDonald, & Fowler (1964); 10. McLeod & Baldwin (2000); 11. Burrin, Ferrell, Britton, & Bauer (1990); 12. Pittroff, Keisler, & Blackburn (2006).

**Table 8. Relative Organ Weight (Percent Body Weight) or Tissue Volume for Goats with the Average Body Weight as 25.56 kg.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Mean** | **SD** | **Number of Animals** | **Number of Studies** | **References** |
| Adipose Tissue | 9.14 | 1.82 | 70 | 2 | 1,2 |
| Blood | 5.49 | 0.51 | 55 | 2 | 3,4 |
| Bone | 7.84 | 1.30 | 56 | 2 | 1,6 |
| Brain | 0.32 | 0.03 | 16 | 1 | 6 |
| GI Tract | 6.55 | 1.13 | 90 | 4 | 1-3,6 |
| Rumen | 2.27 | 0.37 | 8 | 1 | 6 |
| Reticulum | 0.32 | 0.08 | 8 | 1 | 6 |
| Omasum | 0.24 | 0.08 | 20 | 2 | 3,6 |
| Abomasum | 0.86 | 1.10 | 20 | 2 | 3,6 |
| Small Intestine | 1.96 | 0.70 | 28 | 2 | 3,6 |
| Large Intestine | 1.40 | 0.36 | 28 | 2 | 3,6 |
| Cecum | 0.12 | 0.03 | 12 | 1 | 3 |
| Heart | 0.44 | 0.06 | 105 | 6 | 1-3,5,6 |
| Kidneys | 0.38 | 0.06 | 28 | 2 | 3,6 |
| Liver | 1.89 | 0.29 | 82 | 3 | 1-3 |
| Lungs | 1.22 | 0.23 | 98 | 4 | 1-3,6 |
| Muscle | 38.58 | 3.18 | 48 | 2 | 1,6 |
| Skin | 6.77 | 1.11 | 82 | 3 | 1-3 |
| Spleen | 0.19 | 0.03 | 68 | 3 | 1,3,6 |
| Udder (female) | 1.78 | 0.54 | 7 | 1 | 7 |
| Rest of Body | 19.42 |  |  |  |  |

Note: The studies involved in the tissue volume calculations are 1. Mahgoub & Lu (1998); 2. Mahgoub (1997); 3. Ngwa et al. (2009); 4. Riley et al. (1989); 5. McKean & Walker (1974); 6. Courtice (1943); 7. Davis, Davis, & Powers (1975).

**Table 9. Cardiac Output (L/h/kg Body Weight) in Unanesthetized Sheep.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Mean** | **SD** | **Number of Animals** | **Numbers of Study** |
| 7.15 | 2.47 | 126 | 11 |

Note: The value for cardiac output of sheep is based on 11 studies with both lambs and adult sheep (Dodic et al., 2001; Evans et al., 1998; Gregory et al., 1986; Hales, 1973a, 1973b, 1973c; Hales et al., 1976; Hales & Fawcett, 1993; Schiffer et al., 1993; Talke et al., 2000; Ullman et al., 2001). The value of cardiac output for sheep is 7.13 L/h/kg body weight.

**Table 10. Cardiac Output (L/h/kg Body Weight) in Unanesthetized Goats.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Mean** | **SD** | **Number of Animals** | **Numbers of Study** |
| 8.17 | 1.79 | 29 | 3 |

Note: The value for cardiac output of goats is based on 3 studies with both lambs and adult goats (Barcroft et al., 1934; Chaiyabutr et al., 1980; Kutter et al., 2006). The value of cardiac output for goats is 8.17 L/h/kg body weight.

**Table 11. Regional Blood Flow Distribution Percent of Cardiac Output in Sheep**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Mean** | **SD** | **Number of Animals** | **Number of Studies** | **References** | |
| Adrenals | 0.20 | 0.076 | 58 | 5 | 1-5 |
| Adipose Tissue | 6.18 | 4.756 | 16 | 1 | 6 |
| Brain | 2.95 | 1.187 | 54 | 5 | 1,2,4,5,7 |
| Heart | 5.59 | 3.000 | 61 | 6 | 1-5,7 |
| Muscle | 10.09 | 4.206 | 46 | 4 | 4,5,7,8 |
| Kidneys | 12.98 | 5.670 | 96 | 8 | 1-5,7,10,11 |
| Liver | 1.20 | 0.445 | 9 | 1 | 3 |
| Pancreas | 2.35 | 0.865 | 24 | 2 | 3,4 |
| Stomachs | |  |  |  |  | |
| Rumen | 2.57 | 0.977 | 15 | 1 | 4 | |
| Reticulum | 0.92 | 0.346 | 15 | 1 | 4 | |
| Omasum | 0.93 | 0.328 | 24 | 2 | 3,4 | |
| Abomasum | 3.34 | 1.043 | 24 | 2 | 3,4 | |
| Small intestine | 10.70 | 1.263 | 41 | 3 | 1,4,5 | |
| Large Intestine | 8.53 | 1.993 | 46 | 4 | 1,2,4,5 | |
| Pituitary | 0.010 | 0.003 | 41 | 3 | 1,4,5 | |
| Skin | 10.93 | 3.124 | 18 | 2 | 2,5 | |
| Spleen | 4.54 | 2.944 | 58 | 5 | 1-5 | |
| Thyroid | 0.36 | 0.196 | 49 | 4 | 1,2,4,5 | |
| Udder (female) | 11.48 | 5.832 | 5 | 1 | 12 | |
| Rest of Body | 4.16 |  |  |  |  | |

Note: The regional blood flow fractions of sheep were calculated based following studies: 1. Hales (1973c); 2. Hales et al. (1976); 3. Barnes et al. (1983); 4. Hales & Fawcett (1993); 5. Hales (1973b); 6. Gregory et al. (1986); 7. Alexander et al. (1973); 8. Hales (1973a); 9. Gu, Jones, & Parer (1985); 10. Ullman et al. (2001); 11. Robillard et al. (1980); 12. Thompson (1980). If no cardiac output reported in the specific study, the regional blood flow fractions were calculated using the cardiac output of sheep reported in **Table 9**.

**Table 15. Vascular Space or Volume Fraction of Blood (% of Organ Weight, Unitless) in Organs and Tissues of Sheep with Market Age.**

|  |  |  |
| --- | --- | --- |
|  | **Mean** | **SD** |
| BW (kg) | 50.49 | 9.78 |
| Spleen | 34.67 | 1.94 |
| Lungs | 26.63 | 4.45 |
| Liver | 8.10 | 1.32 |
| Kidneys | 5.67 | 0.64 |
| Pituitary | 2.20 | 0.26 |
| Adrenal | 3.17 | 1.00 |
| Heart | 5.13 | 0.64 |
| Pancreas | 3.27 | 0.75 |
| Loin muscle | 1.17 | 0.31 |
| Gastrocnemius Muscle | 1.13 | 0.40 |

Notes: Very limited studies were identified for the residual blood volume in organs of sheep. All data reported in the table were from the study of Hansard (1956) with values from 3 animals.

**Table 16. Vascular Space or Volume Fraction of Blood (% of Organ Weight, Unitless) in Organs and Tissues of Lambs.**

|  |  |  |
| --- | --- | --- |
|  | Mean | SD |
| BW (kg) | 4.23 | 1.39 |
| Spleen | 34.83 | 1.63 |
| Lungs | 18.20 | 1.90 |
| Liver | 9.57 | 0.87 |
| Kidneys | 5.57 | 0.71 |
| Pituitary | 2.03 | 0.15 |
| Adrenal | 1.90 | 0.20 |
| Heart | 5.93 | 0.55 |
| Pancreas | 3.10 | 0.95 |
| Loin muscle | 1.90 | 0.66 |
| Gastrocnemius Muscle | 1.67 | 0.31 |

Notes: Very limited studies were identified for the residual blood volume in organs of sheep. All data reported in the table were from the study of Hansard (1956) with values from 3 animals.

**Table 18. Hematocrit (%) for Market-age Sheep**

|  |  |  |  |
| --- | --- | --- | --- |
| **Mean** | **SD** | **Number of Animals** | **Numbers of Study** |
| 34.69 | 3.09 | 174 | 5 |

Notes: The hematocrit of market-age sheep was calculated based on five studies (Degen & Young, 1981; Gomes et al., 2013; Hart & Doyle, 1985; Horton & Burgher, 1992; Mayland et al., 1986). The value of hematocrit for market-age sheep is 34.69% based on these studies.

**Table 19. Hematocrit (%) for Lambs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Mean** | **SD** | **Number of Animals** | **Numbers of Study** |
| 34.37 | 8.11 | 6321 | 9 |

Notes: The hematocrit of lambs was calculated based on nine studies (Alhidary et al., 2012; Campbell et al., 2014; Degen & Young, 1981; Marsh et al., 2001; Matson et al., 1981; Meyer-Gesch et al., 2013; Rege et al., 2002; Robillard & Weitzman, 1980; Roghair et al., 2004). The value of hematocrit for lambs is 34.37% based on these studies.

**Table 21. Hematocrit (%) for Goats**

|  |  |  |  |
| --- | --- | --- | --- |
| **Mean** | **SD** | **Number of Animals** | **Numbers of Study** |
| 29.38 | 7.38 | 29 | 5 |

Notes: The hematocrit for goats was calculated based on five studies (Anosa & Isoun, 1976; Courtice, 1943; McKean & Walker, 1974; Olsén et al., 2013; Olsson et al., 1994). The value of hematocrit for goats is 29.38% based on these studies.