**Table (1): Impact of urea treatment on the chemical composition of olive trees by-products**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Item | UOTB | OTB1 | OTB2 | OTB3 | OTB4 | OTB5 | OTB6 | | | BH |
| Cheminal analysis (g/Kg DM) | | | | | | | | | | | |
| DM | 897.2 | 906.8 | 912.2 | 915.0 | 930.0 | 932.1 | 938.9 | | 912.4 | | |
| OM | 830.0 | 833.0 | 840.0 | 844.0 | 851.8 | 855.0 | 858.0 | | 880.1 | | |
| Ash | 170.0 | 167.0 | 160.0 | 156.0 | 148.2 | 145.0 | 142.0 | | 119.9 | | |
| CP | 67.5 | 120.0 | 129.7 | 131.0 | 142.2 | 149.5 | 154.0 | | 140.0 | | |
| CF | 245.0 | 189.6 | 182.0 | 179.5 | 166.4 | 164.3 | 159.5 | | 326.4 | | |
| EE | 54.0 | 57.0 | 58.4 | 59.0 | 59.3 | 59.5 | 59.5 | | 25.5 | | |
| NFE | 463.5 | 466.4 | 469.9 | 474.5 | 483.9 | 481.7 | 485.0 | | 388.2 | | |
| Cell wall constituents (g/kg DM) | | | | | | | | | | | |
| NDF | 525.4 | 505.8 | 482.9 | 464.1 | 449.4 | 446.5 | | 443.0 | 447.0 | | |
| ADF | 388.0 | 380.7 | 372.4 | 348.1 | 328.1 | 323.5 | | 315.6 | 360.0 | | |
| ADL | 121.0 | 113.0 | 104.5 | 98.9 | 78.5 | 78.0 | | 77.8 | 71.3 | | |
| Cellulose | 267.0 | 267.7 | 267.9 | 249.2 | 249.6 | 245.5 | | 237.8 | 288.7 | | |
| Hemicellulose | 137.4 | 125.1 | 110.5 | 116.0 | 121.3 | 123.0 | | 127.4 | 87.0 | | |

*UOTB, untreated olive trees by products; OTB1, olive trees by products treated with urea (1%/ kg DM); OTB2, olive trees by products treated with urea (2%/ kg DM); OTB3, olive trees by products treated with urea (3%/ kg DM); OTB4, olive trees by products treated with urea (4%/ kg DM); OTB5, olive trees by products treated with urea (5%/ kg DM); OTB6, olive trees by products treated with urea (6%/ kg DM),BH, berseem hay*

**Table (2): Chemical composition of the experimental rations (g/kg of DM)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Item | CFM | CBH | UOTB | OTB2 | OTB4 | | OTB6 |
| Chemical composition (%): | | | | | |
| DM | 935.9 | 928.9 | 924.3 | 928.8 | 934.1 | | 936.8 |
| OM | 920.6 | 908.5 | 893.4 | 896.4 | 900.0 | | 901.8 |
| Ash | 79.4 | 91.6 | 106.6 | 103.6 | 100.0 | | 98.2 |
| CP | 125.1 | 129.6 | 107.8 | 126.5 | 130.2 | | 133.8 |
| CF | 113.5 | 177.4 | 153.0 | 134.1 | 129.4 | | 127.3 |
| EE | 31.0 | 29.4 | 37.9 | 39.2 | 39.5 | | 39.6 |
| NFE | 651.0 | 572.2 | 594.8 | 596.7 | 600.9 | | 601.2 |
| Cell wall constituents (%) | | | | | |
| NDF | 306.5 | 348.7 | 372.2 | 359.4 | 349.4 | | 347.5 |
| ADF | 175.6 | 230.9 | 239.3 | 234.6 | 221.4 | | 217.6 |
| ADL | 68.5 | 69.3 | 84.3 | 79.3 | 71.5 | | 71.3 |
| Cellulose | 107.1 | 161.6 | 155.1 | 155.3 | 149.9 | | 146.3 |
| Hemicellulose | 130.9 | 117.7 | 132.9 | 124.8 | 128.0 | | 129.9 |

*CFM, concentrated feed mixture; CBH, group fed 70% concentrate feed mixture (CFM) + berseem hay ad lib; UOTB, group fed 70% concentrate feed mixture (CFM) + untreated olive trees by products ad lib; OTB2, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (2%/kg DM) ad lib; OTB4, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (4%/kg DM) ad lib; OTB6, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (6%/kg DM) ad lib.*

**Table (3): Impact of urea treatment on ewe’s body weight, feed intake and nutrients digestibility**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Item | Experimental groups | | | | | |
|  | CBH | UOTB | OTB2 | OTB4 | OTB6 | SE |
| No. of animals | 4 | 4 | 4 | 4 | 4 |  |
| Initial body weight, Kg | 31.68 | 30.40 | 31.31 | 31.99 | 32.30 | 0.473 |
| Final body weight, Kg | 33.71b | 32.30c | 33.52b | 35.00a | 35.32a | 0.241 |
| Body weight change,Kg | 2.03b | 1.90b | 2.21b | 3.01a | 3.02a | 0.107 |
| Feed intake, g/h/d | 1393.91b | 1359.65c | 1412.5a | 1387.1b | 1426.03a | 6.43 |
| Digestibility, % | | | | | | |
| DM | 64.17c | 63.04c | 67.84b | 71.41a | 70.81a | 0.424 |
| OM | 65.05c | 63.97d | 68.13b | 72.03a | 71.79a | 0.2 |
| EE | 72.50b | 71.34c | 73.04b | 74.80a | 74.77a | 0.315 |
| CP | 64.32c | 64.07c | 65.95b | 69.73a | 69.69a | 0.386 |
| CF | 53.28c | 52.38c | 56.76b | 61.34a | 61.24a | 0.493 |
| NFE | 68.13c | 67.45c | 69.045b | 70.89a | 70.56a | 0.278 |
| Fiber fractions, % | | | | | | |
| NDF | 59.03c | 56.86d | 62.64b | 64.92a | 64.13a | 0.31 |
| ADF | 47.27c | 45.78d | 51.81b | 55.42a | 54.66a | 0.431 |

*∗Means with different letter in the same row are significantly different at (p<0.05).*

*CBH, group fed 70% concentrate feed mixture (CFM) + berseem hay ad lib; UOTB, group fed 70% concentrate feed mixture (CFM) + untreated olive trees by products ad lib; OTB2, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (2%/kg DM) ad lib; OTB4, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (4%/kg DM) ad lib; OTB6, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (6%/kg DM) ad lib.*

**Table (4): Impact of experimental rations on ewe’s ruminal parameters**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Item | CBH | UOTB | OTB2 | OTB4 | OTB6 | ±SE |
| PH | 6.77a | 6.35b | 6.25bc | 6.05d | 6.10cd | 0.05 |
| TVFA’s, mg/100 ml | 8.89c | 8.68d | 9.99b | 10.30a | 10.14ab | 0.07 |
| Total N, mg/100 ml | 111.12b | 107.02c | 122.14a | 124.45a | 123.82a | 0.87 |
| True protein N, mg/100 ml | 41.07c | 37.90d | 44.53b | 51.15a | 50.60a | 0.82 |
| NPN, mg/100 ml | 70.05bc | 69.12c | 77.61a | 73.30b | 73.21b | 1.11 |
| Ammonia N, mg/100 ml | 33.52d | 32.42e | 35.61c | 40.41b | 41.97a | 0.26 |

*∗Means with different letter in the same row are significantly different at (p<0.05).*

*CBH, group fed 70% concentrate feed mixture (CFM) + berseem hay ad lib; UOTB, group fed 70% concentrate feed mixture (CFM) + untreated olive trees by products ad lib; OTB2, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (2%/kg DM) ad lib; OTB4, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (4%/kg DM) ad lib; OTB6, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (6%/kg DM) ad lib.*

**Table (5): Impact of experimental rations on ruminal ciliate protozoa count (x104 cell /ml rumen liquor)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Item |  | Experimental group | | | | | ±SE |
| CBH | UOTB | OTB2 | OTB4 | OTB6 |
| *Entodinum spp.* | | 5.988c | 5.782d | 6.182b | 6.693a | 6.325b | 0.049 |
| *Epidinium spp.* | | 0.236b | 0.234b | 0.247a | 0.251a | 0.245a | 0.002 |
| *Diplodinum spp.* | | 0.205bc | 0.202c | 0.208b | 0.215a | 0.213a | 0.001 |
| *Ophryoscoloxspp* | | 0.246bc | 0.243c | 0.249ab | 0.250a | 0.245c | 0.001 |
| *Polyolastron spp.* | | 0.403d | 0.404cd | 0.417b | 0.440a | 0.412bc | 0.002 |
| *Isotrchia spp.* | | 0.281ab | 0.280ab | 0.270b | 0.289a | 0.284ab | 0.004 |
| *Dasytrachia spp.* | | 0.476c | 0.490b | 0.498b | 0.526a | 0.501b | 0.004 |
| Total protozoa count | | 7.838e | 7.637d | 8.073c | 8.667a | 8.227b | 0.049 |

*∗Means with different letter in the same row are significantly different at (p<0.05).*

*CBH, group fed 70% concentrate feed mixture (CFM) + berseem hay ad lib; UOTB, group fed 70% concentrate feed mixture (CFM) + untreated olive trees by products ad lib; OTB2, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (2%/kg DM) ad lib; OTB4, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (4%/kg DM) ad lib; OTB6, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (6%/kg DM) ad lib.*

**Table (6): Impact of experimental rations on ewe’s blood composition**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Item | Experimental group | | | | | ±SE |
| CBH | UOTB | OTB2 | OTB4 | OTB6 |
| Total proteins, g/dl | 6.77c | 6.36d | 7.14b | 7.73a | 7.19b | 0.107 |
| Albumin, g/dl | 3.58c | 3.37d | 3.89b | 4.80a | 4.01b | 0.072 |
| Globulin, g/dl | 3.19ab | 2.99bc | 3.25a | 2.93c | 3.18ab | 0.096 |
| A/G ratio | 1.12c | 1.13c | 1.20bc | 1.64a | 1.26b | 0.038 |
| Urea, mg/dl | 38.42a | 37.10a | 28.58b | 27.93b | 27.21b | 1.072 |
| AST, U/L | 24.83ab | 25.66a | 23.39b | 23.18b | 23.45b | 0.635 |
| ALT, U/L | 5.69ab | 6.09a | 5.79a | 4.77b | 5.76a | 0.312 |

*∗Means with different letter in the same row are significantly different at (p<0.05).*

*CBH, group fed 70% concentrate feed mixture (CFM) + berseem hay ad lib; UOTB, group fed 70% concentrate feed mixture (CFM) + untreated olive trees by products ad lib; OTB2, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (2%/kg DM) ad lib; OTB4, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (4%/kg DM) ad lib; OTB6, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (6%/kg DM) ad lib.*

**Table (7): Impact of experimental rations on ewe’s milk yield and its composition**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Item |  | Experimental group | | | | | ±SE |
| CBH | UOTB | OTB2 | OTB4 | OTB6 |
| Milk yield g/h/d | | 935.47d | 931.66d | 991.19c | 1070.95a | 1043.80b | 5.875 |
| 4% FCM g/h/d | | 869.21d | 863.77d | 930.71c | 1026.20a | 987.16b | 5.508 |
| Total solids | | 12.409d | 12.38d | 12.51c | 13.00a | 12.66b | 0.015 |
| Fat | | 3.53d | 3.51d | 3.59c | 3.72a | 3.64b | 0.007 |
| Solids not fat | | 8.87c | 8.86c | 8.91c | 9.28a | 9.01b | 0.016 |
| Total protein | | 3.77d | 3.76d | 3.88c | 4.00a | 3.92b | 0.004 |
| Lactose | | 4.19d | 4.17d | 4.43c | 4.57a | 4.49b | 0.013 |
| Ash | | 0.979c | 0.977c | 1.013b | 1.021a | 1.016ab | 0.002 |

*∗Means with different letter in the same row are significantly different at (p<0.05).*

*CBH, group fed 70% concentrate feed mixture (CFM) + berseem hay ad lib; UOTB, group fed 70% concentrate feed mixture (CFM) + untreated olive trees by products ad lib; OTB2, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (2%/kg DM) ad lib; OTB4, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (4%/kg DM) ad lib; OTB6, group fed 70% concentrate feed mixture (CFM) + olive trees by products treated with urea (6%/kg DM) ad lib.*