|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Metabolite** | **LC/CON** | **LC/CE** | **CE/CON** | **Metabolite** | **LC/CON** | **LC/CE** | **CE/CON** |
| **Esters** |  |  |  | 5Beta-androstane-3,17-dione | 0.96 | 1 | 0.95\*\* |
| L-Gulonolactone | 1.03\* | 1.04\*\* | 1 | Androsterone | 0.96 | 1.01 | 0.95\*\* |
| Lyxonic acid, 1,4-lactone | 0.94\*\*\* | 0.96\* | 0.98 | 1-Indanone | 1.24 | 0.86 | 1.44\* |
| Gluconic lactone | 1.03 | 1.05\* | 0.98 | **Polyols** |  |  |  |
| Ethyl cinnamate | 1.02 | 1.02 | 1 | Acetol | 0.98\*\* | 1 | 0.97\*\* |
| Mono(2-ethylhexyl)phthalate | 1.02 | 1.02 | 1 | Benzyl alcohol | 0.98\* | 0.99 | 0.99 |
| D-erythronolactone | 1.02 | 1.02\*\* | 0.99 | Salicyl alcohol | 0.97\* | 1.02 | 0.95\* |
| Linoleic acid methyl ester | 1.01 | 1.02\* | 0.98 | Tryptophol | 0.95\*\*\* | 1.01 | 0.94\*\*\* |
| Methyl octadecanoate | 1.01 | 1.02 | 0.99 | Piceatannol | 1.02 | 1.02 | 1 |
| Docosanoic acid methyl ester | 1.01 | 1.02 | 0.99 | Glycerol | 1 | 1.01 | 0.99 |
| Methyl icosanoate | 1.01 | 1.02 | 0.99 | 4-Hydroxy phenylethanol | 1 | 1 | 0.99 |
| Methyl hexadecanoate | 1 | 1.01 | 0.99 | Threitol | 1 | 1.02 | 0.98 |
| Methyl decanoate | 1 | 1.01 | 0.99 | Farnesol | 1 | 1.01 | 1 |
| Tetradecanoic acid, methyl ester | 1 | 1.01 | 0.99 | 3-Methylamino-1,2-propanediol | 1 | 1 | 0.99 |
| Tetracosanoic acid, methyl ester | 1 | 1.02 | 0.99 | Coniferyl alcohol | 1 | 1.01 | 0.99 |
| Methyl dodecanoate | 1 | 1.02 | 0.99 | (+-)-Dihydrocarveol | 1 | 1.01 | 0.99 |
| Mevalonic acid lactone | 1 | 0.94\*\*\* | 1.06\*\*\* | 4-Hydroxy-3-methoxybenzyl alcohol | 1 | 1.01 | 0.99 |
| Methyl Palmitoleate | 0.99 | 1 | 0.99 | Ribitol | 1 | 0.99 | 1.01 |
| Benzyl thiocyanate | 0.99 | 1.03 | 0.95\*\* | Phytol | 1 | 1.01 | 0.99 |
| **Ketones** |  |  |  | Xylitol | 0.99 | 0.99 | 1 |
| Dihydroxyacetone | 0.98\*\*\* | 0.99 | 0.99 | Diglycerol | 0.99 | 1 | 1 |
| 21-hydroxypregnenolone | 0.94\*\* | 1.03 | 0.91\*\* | Mannitol | 0.99 | 0.99 | 1 |
| 3-Hydroxyflavone | 1.02 | 1.02\*\*\* | 0.99 | D-Arabitol | 0.98 | 1.01 | 0.97\*\* |
| Adrenosterone | 0.99 | 1.15 | 0.86 | 4-Methyl-5-thiazolethanol | 0.96 | 0.97 | 0.98 |
| Estrone | 0.98 | 0.99 | 0.99 | Sorbitol | 0.95 | 0.94 | 1.01 |

**Table S5** Metabolites belonging to esters, ketones, and polyols in alfalfa silage treated with cellulase and *L. casei* after air exposure for 3 days

CON, untreated silage; CE, silages treated with cellulase; LC, silage treated with *L. casei*;

“\*” 0.01<P <0.05; “\*\*” 0.001< P < 0.01; “\*\*\*” P < 0.001