$$\min_{\substack{q_{i,l},\ y_{l,j},\\ z_{i,j}}} \sum_{\substack{(i,\ l)\in T_X\\ (l,\ j)\in T_Y}} c_i \cdot q_{i,l} \cdot y_{l,j} - \sum_{(l,j)\in T_Y} d_j \cdot y_{l,j} - \sum_{(i,j)\in T_Z} (d_j - c_i) \cdot z_{i,j} \tag{Q1}$$

$$\text{Feed availability} \left[A_i^L \le \sum_{\substack{l\,:\,(i,\ l)\in T_X\\ (l,\ j)\in T_Y}} q_{i,l} \cdot y_{l,j} + \sum_{j:(i,j)\in T_Z} z_{i,j} \le A_i^U \quad \forall\, i \right. \tag{Q2}$$

$$\text{Pool capacity} \left[\sum_{j:(l,j)\in T_Y} y_{l,j} \le S_l \quad \forall\, l \right. \tag{Q3}$$

$$\text{Product demand} \left[D_j^L \le \sum_{l:(l,j)\in T_Y} y_{l,j} + \sum_{i:(i,j)\in T_Z} z_{i,j} \le D_j^U \quad \forall\, j \right. \tag{Q4}$$

$$\text{Simplex definition} \left[\sum_{i:(i,\ l)\in T_X} q_{i,l} = 1 \quad \forall\, l \right. \tag{Q5}$$