## TABLE B.3
### Preliminary operating cost estimates

**A. Direct production cost**
1. **Materials**
   a. Raw materials: estimate from price lists, government and trade group reports
   b. Byproduct and scrap credit: estimate from price lists
2. **Utilities**: from literature or similar operations
3. **Labor**: from historical data, manning tables, literature, or similar operations
4. **Supervision**: 10–25% of labor
5. **Fringe benefits and FICA**: 30–45% of labor plus supervision
6. **Maintenance**: 2–10% of investment per year
7. **Operating supplies**: 0.5–1.0% of investment per year, or 6–10% of operating labor
8. **Laboratory**: 10–20% of labor per year
9. **Waste disposal**: from literature, similar operations, or separate estimate
10. **Royalties**: 1–5% of sales
11. **Contingencies**: 1–5% of sales

**B. Indirect costs**
1. **Depreciation**: 10–20% of investment per year
2. **Real estate taxes**: 1–2% of investment per year
3. **Insurance**: 0.5–1.0% of investment per year
4. **Interest**: 10–12% of investment per year
5. **General administrative overhead**: 50–70% of labor, supervision, and maintenance, or 6–10% of sales

**C. Distribution costs**
1. **Packaging**: estimate from container costs
2. **Shipping**: from carriers or 1–3% of sales

*Sources: Jelen and Black (1983), Garrett (1989), Turton et al. (1998).*