Discrete-time Lotka-Volterra model:

$$
\begin{aligned}
V_{t+1} &= rV_t - aP_tV_t \\
P_{t+1} &= sP_t + acP_tV_t
\end{aligned}
$$

V is prey ("victim"), P is predator. r is prey growth rate; a is attack rate of predators; c is conversion efficiency of predators; s is predator survival in the absence of prey.

Assume $\{r, a, c\} > 0$, $0 < s < 1$.

Compute equilibria: $\{0, 0\}$, $\{(1-s)/(ac), (r-1)/a\}$

Calculate Jacobian:

$$
\begin{pmatrix} r - aP^* & -aV^* \\ acP^* & s + acV^* \end{pmatrix}
$$

Stability of 0 eq: J is

$$
\begin{pmatrix} r & 0 \\ 0 & s \end{pmatrix}
$$

We hardly need the Jury conditions $|T| < 1 + \Delta < 2$ for this case, we can read off the diagonals. Zero equilibrium is stable iff $r < 0$ (we have $0 < s < 1$ by assumption).

Jacobian at non-trivial equilibrium:

$$
\begin{pmatrix} 1 & (s-1)/c \\ (r-1)c & 1 \end{pmatrix}
$$

$T = 2$; $\Delta = 1 - (r-1)(s-1)$. We need $2 < 1 + (r-1)(s-1) < 2$. This can never be stable.