For $f > \sqrt{\frac{g}{k}}$, the oscillation is unstable due to increased energy transfer.

The diagram on the right illustrates the concept of energy transfer in oscillating systems. In the diagram, the energy is shown as waves propagating in a medium. The peaks and troughs of the waves represent the energy distribution, with the highest peaks indicating the points of maximum energy transfer. The direction of the waves shows the propagation of energy from one point to another.