Addition of AAF to murine splenocytes culture produced a dose-related suppression of lymphoproliferative response to lipopolysaccharide (LPS). The time course of the suppression showed that a significant inhibition was occurred after a 18 hr AAF treatment. Total protein kinase C activity in splenocytes was decreased to 72% of control level after a 18 hr AAF treatment. Phosphorylation of a PKC specific 80 kDa protein was increased by LPS and AAF down-regulated LPS-induced PKC activity. LPS-induced phosphorylation of overall proteins in membrane and cytosolic fraction were also decreased by the treatment of AAF. A significant increase of PKC activity in membrane fraction was noticed within 10 min of AAF treatment compared to LPS alone and then gradually decreased to LPS level in 60 min. Meanwhile, PKC activity in cytosolic fraction was increased slightly in 10 min by the treatment of AAF and then decrease to 80% LPS level in 30 min. These results suggested that suppressive effect of AAF on LPS-induced lymphoproliferative response may be associated with the down-regulation of PKC and other susceptible kinases in spleen cells.