Presenting the Monty Hall Problem

Offer a contestant 3 boxes with prizes inside — 2 are duds and 1 is something good.

Allow them to choose any box.

At least one and maybe both of the other two boxes have dud prizes in them.

Show them to contents of one of the dud prize boxes (you have to keep track of this).

Now offer a new deal:

They can keep their original choice, or switch and take the remaining unopened box.

Question: Which strategy should give the best aggregate results if a contestant plays the game many times?

Consider:
Box 1 Box 2 Box 3

By choosing a box and staying with it, you have a 1/3 chance of finding the prize.

If you choose one box among 3, there is a 2/3 chance the prize is among the two you didn't choose. Revealing the dud doesn't change that, so if you switch, you are switching from a 1/3 probability to a 2/3 probability of getting the good prize.

Question: If you used a mixed strategy, alternating between staying with your original guess and taking the switch, would that give you a 1/2 or 50% chance over time??