House Edge Reference Sheet

> **Purpose:** This reference sheet provides information about the house edge in various gambling activities. Use it to compare different games and understand the mathematical advantage that gambling establishments maintain.

House Edge Formula:

House Edge = |Expected Value| / Wager Amount × 100%

OR

House Edge = (Casino Profit) / (Total Amount Wagered) × 100%

What is House Edge?

The house edge is the mathematical advantage that gambling games, casinos, and betting establishments have over players. It's expressed as a percentage of each bet that the house expects to keep over the long run. For example, a house edge of 5% means that, on average, the casino expects to keep $5 of every $100 wagered.

Calculation Example: American Roulette

A straight-up bet on a single number in American roulette pays 35 to 1 if you win.

Probability of winning: 1/38 (one number out of 38 total spaces)

Probability of losing: 37/38

Expected Value calculation:

EV = (1/38 × $35) + (37/38 × -$1) = $0.921 - $0.974 = -$0.053

House Edge = |-$0.053| / $1 × 100% = 5.26%

House Edge by Game Category

The tables below show the house edge for various gambling activities, organized by category. Games are color-coded by house edge range:

- Green (Low house edge: less than 2%)
- Yellow (Medium house edge: 2-5%)
- Red (High house edge: more than 5%)

Table Games

Game	Bet Type	House Edge	Notes
Blackjack	Basic Strategy	0.5% - 1%	Varies by specific rules; requires optimal play
Craps	Pass Line/Come	1.41%	One of the better bets in the casino
Craps	Don't Pass/Don't Come	1.36%	Slightly better than Pass Line
Craps	Any 7	16.67%	One of the worst bets in craps
Baccarat	Banker Bet	1.06%	Includes 5% commission on wins
Baccarat	Player Bet	1.24%	No commission
Baccarat	Tie Bet	14.36%	Very poor odds despite high payouts

Roulette

Game Variant	Bet Type	House Edge	Notes
European Roulette	All Bets	2.7%	Single zero wheel
American Roulette	All Bets	5.26%	Double zero wheel
American Roulette	Five-number bet	7.89%	Worst bet in roulette (0, 00, 1, 2, 3)

Slot Machines and Video Poker

Game	Type	House Edge	Notes
Slot Machines	Penny Slots	10% - 15%	Highest house edge of any common casino game
Slot Machines	Dollar Slots	5% - 10%	Better than penny slots, but still high house edge
Slot Machines	High-Limit Slots	3% - 5%	Better odds, but requires larger wagers
Video Poker	9/6 Jacks or Better	0.46%	Requires optimal play; "9/6" refers to full house/flush payouts
Video Poker	8/5 Jacks or Better	2.7%	More common version with worse payouts

Other Gambling Activities

Game	Type	House Edge	Notes
Pai Gow Poker	Base Game	1.5% - 2.5%	Relatively slow pace of play reduces hourly expected loss
Three Card Poker	Ante & Play	3.37%	Simple but higher house edge than traditional poker
Big Six Wheel	$1 Space	11.1%	One of the worst games in a casino
Keno	Standard Game	25% - 29%	Extremely high house edge
State Lotteries	Typical Draw Game	40% - 50%	Highest house edge of any common gambling activity
Scratch-off Tickets	Typical Game	20% - 35%	Very poor odds despite frequent small wins

Factors That Affect House Edge

1. Game Rules Variations: Small rule changes can significantly impact the house edge. For example, a blackjack game that pays 6:5 for a natural blackjack (instead of the traditional 3:2) increases the house edge by about 1.4%.

2. Skill Level: In games with an element of skill (like blackjack, video poker), the house edge is calculated assuming optimal play. Players who make strategic errors face a higher effective house edge.

3. Betting Options: Within the same game, different betting options can have vastly different house edges. For example, in craps, the Pass Line bet has a 1.41% house edge, while the Any 7 bet has a 16.67% house edge.

4. Comps and Promotions: Casino rewards programs and promotions can effectively reduce the house edge, but rarely eliminate it entirely.

Understanding Long-Term Impact

To calculate your expected loss over time:

1. Multiply your average bet size by the number of bets per hour
2. Multiply that by the number of hours played
3. Multiply that result by the house edge (as a decimal)

Expected Loss Calculation Example

Let's say you're playing American roulette, betting $10 per spin, making 50 spins per hour, for 3 hours:

Expected Loss = $10 (bet size) × 50 (bets per hour) × 3 (hours) × 0.0526 (house edge)

Expected Loss = $79.90

Note: *The house edge is a mathematical expectation over an infinite number of trials. In the short term, results can vary significantly due to variance ("luck"). However, the longer someone plays, the more likely their actual results will approach the mathematical expectation.*