

**Analysis
For
Headstart Hold'em
Video Poker Version
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**Prepared
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Analysis of Headstart Hold'em Video Poker

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Game Description:

Headstart Hold'em Video Poker is based on the popular game of Texas Hold'em Poker. Each Player initially wagers on each of the five (5) initial 2-card predetermined hands. The game then reveals the first 3 community cards (known as the Flop). The Player must now decide whether to Raise or Fold each hand. The Player may Raise as many hands as he wishes. If he does not Raise, the hand is Folded.

The game then reveals the final 2 community cards (the Turn and the River). If the Player has raised the winning hand AND the winning hand consists of Three of a Kind or better (or Two Pair using the alternate payable), the Player will win according to the payable shown.

Additionally, the Player may wager on the Flop Bonus. The Player wins this wager if the three-card Flop is a Pair or Better

How to Play

To begin, the Player must make an initial wager. The Player may wager from 1 to 'max' coins per each starting hand. The casino and/or the gaming jurisdiction will determine the maximum number of coins. Mathematically, there is no impact to the payback by betting more or less coins per hand. The amount bet must be the same for each starting hand.

He may either Press the *Bet One* button, which will add 1 unit to the wager for EACH hand (or FIVE units in total) or he may Press the *Bet Max* button which will result in the Player betting the maximum allowed units per hand for a total units wagered of 5 times the maximum wager per hand. So, if the maximum number of units is set to 5, pressing *Bet Max* will result in wagering 25 units. In this case, if he presses *Bet Max*, the *Wager* meter will display 25 and the Flop Cards will be dealt. If he presses *Bet One* the wager meter will increment by 5. If it reaches the maximum allowed, the Flop Cards will be dealt. If the Player wishes to wager less than 5 Units per hand, he may press the *Deal* button at any time after pressing the *Bet One* button at least once. Pressing the *Deal* button will cause the Flop Cards to be dealt.

Prior to pressing the *Deal* button or the *Bet Max* button, the Player may wager on the Flop Bonus wager by using the *Flop Bonus Increase* button. He may wager up to the maximum number of Units as determined by the casino or gaming jurisdiction. If he wishes to decrease his wager, he may use the *Flop Bonus Decrease* button. The Player may reduce his wager to zero if he does

not wish to wager on this. This wager will not reset after each hand, so if he wishes to continue betting the same amount as the prior hand, the Player need not do anything.

Once the *Deal* button is pressed, or the Wager reaches the maximum allowed, the Flop Cards will be dealt. The game will determine if the Player wagered on the Flop Bonus and display the number of units won in the *Flop Bonus Won* box. The game will display the rank of the Flop hand, if it is a Pair or Better, below the Flop Cards. The number of units won will be added to the Player's *Credits*.

At this point, the Player must decide whether to Raise or Fold each hand. If he wishes to Raise the hand, he must press the *Raise* button below that hand. The *Raise* button will turn green indicating the hand is Raised. If the Player wishes to change his mind, he may press the Raise Button again. It will turn back to the original gray color indicating that the hand will Fold when the Player presses the *Draw* button. By pressing the *Raise* button, the Player will be wagering additional units on that hand equal to the amount of units originally wagered on each hand.

Once the Player presses the *Draw* button, the final 2 community cards are revealed. The game will highlight the winning hand(s) in green. If the Player has Raised the winning hand, his winnings will be shown in the *Coins Won* box and this total will be added to his *Credits*.

Each of the 5 hands has its own payable that is used for Headstart Hold'em Video Poker. The amounts shown below are on a per unit wagered basis (Initial Wager and Raise Wager). The Player will be paid if he Raised the winning hand according to the payable below:

Cards	A♣ K♥	Q♠ J♠	8♦ 9♦	5♦ 5♥	2♣ 7♥
Royal Flush	250	100	1000	1000	1000
Straight Flush	100	40	40	100	100
Four of a Kind	30	20	25	15	50
Full House	10	8	8	5	20
Flush	8	4	5	NA	NA
Straight	6	3	4	5	15
Three of a Kind	5	3	3	3	6

Headstart Hold'em Video Poker uses a standard 52-card deck. There are ten cards that make up the five initial 2 card predetermined hands. These 10 cards are removed from the original deck. The 3-Card Flop, Turn and River cards are drawn randomly from the remaining 42-card deck.

Analysis Methodology:

As there are only five random cards being drawn per game, it is possible to create a computer program that will analyze every possible draw. The first of these programs calculated how often each of the five hands won and with what Poker Rank each hand won.

A second program analyzed each hand after every possible combination of 3-Card Flop was dealt (there are 11,480 unique 3-Card Flops). It then simulated playing each possible remaining 2-card draw. There are 741 2-Card draws for each of the 11,480 3-Card Flops for a total of 8,288,560 possible hands analyzed.

After the 3-Card Flop has been revealed, it was determined if it was better to Fold or Raise each of the 5 initial hands. Raising means to place an additional wager on that hand equal to the original wager for that hand. In some cases, Raising may not result in an expected win for the Player, but it will reduce his expected loss vs. Folding.

An additional program was created that tabulated the results for the optional Flop Bonus bet, ranking each hand based on the 3-Card Flop.

Results:

The results from the first program are shown in the tables below. This program simulated the 850,668 possible ways that five cards can be dealt from the remaining 42 cards in the deck. The total number of wins is greater than this, because if two or more hands tie, both are considered to be winners.

Hand	Roy	Straight Flush	Four of a Kind	Full House	Flush	Straight	Three of a Kind	Two Pair	Pair	Total
2♣ 7♥	1	122	1,491	16,116	0	7,329	19,550	23,044	0	68,063
5♦ 5♥	1	197	9,878	56,785	0	15,579	68,046	4,983	0	155,879
8♦ 9♦	1	2,157	1,491	19,280	56,925	36,408	22,588	34,519	4,748	180,700
J♠ Q♠	742	1,417	1,491	21,165	69,951	40,926	22,740	53,026	25,222	237,090
A♣ K♥	77	48	1,631	23,049	15,957	17,789	20,847	67,259	69,344	216,001
Total	822	3,941	15,982	136,395	142,833	118,031	153,771	182,831	99,314	853,920

The overall win frequency for each hand is in the table below:

Hand	Win Frequency
2♣ 7♥	8.00%
5♦ 5♥	18.32%
8♦ 9♦	21.24%
J♠ Q♠	27.87%
A♣ K♥	25.39%

The second program, which determined perfect strategy for each of the 5-initial predetermined hands, tabulated the following results. The Overall Payback was calculated using the pay table shown earlier in this report and assuming perfect play. Any strategy that deviates from the perfect strategy will result in a lower overall payback.

Cards	Play Frequency	Fold Frequency
2♣ 7♥	40.08%	59.92%
5♦ 5♥	29.06%	70.94%
8♦ 9♦	49.55%	50.45%
J♠ Q♠	52.87%	47.13%
A♣ K♥	45.47%	54.53%

The overall payback of any single hand in Headstart Hold'em Video Poker has no real meaning because the Player MUST wager on all 5 hands initially. Thus, the only payback that is truly significant is that of the entire game. This is derived by the computer simulation playing each hand according to perfect strategy. In this manner, the total number of coins wagered and returned is tabulated. By dividing the number of coins returned by the number of coins wagered, we arrive at the total payback of Headstart Hold'em Video Poker. This calculation is shown in the table below:

Cards	Total Coins Wagered	Total Coins Returned	Payback
2♣ 7♥	11,916,021	11,178,628	93.8118%
5♦ 5♥	10,978,656	10,723,700	97.6777%
8♦ 9♦	12,721,488	13,359,342	107.0919%
J♠ Q♠	13,003,809	13,926,032	105.0140%
A♣ K♥	12,374,700	10,918,466	88.2322%
Total	60,994,674	60,106,168	98.5433%

Games with community cards will generate a higher rate of 'Ties' than similar games without community cards. In Headstart Hold'em Video Poker, if two hands tie as the highest hand, both hands will be paid as if they had won outright according to their payable. Because of the specific starting hands used, it is only possible for all 5 hands to tie as a result of the community cards all being used to make up the top hand. All Players who made the Raise bet on their respective hands will be paid according to the payable. The five community cards will form the winning hand 813 times (0.0956% of all hands). Of these hands, 609 will be Straights, 180 will be Full Houses, 12 will be Four of a Kinds, 11 will be Straight Flushes and 1 will be a Royal. The impact of Ties has been fully accounted for in the calculations of the overall payback for Headstart Hold'em Video Poker.

It should be noted that this report shows the payback calculation for a single payable. It is possible to create a payable for virtually any total payback desired. Each payable will create strategy changes that will affect the average number of hands 'Raised' per deal.

The Flop bonus bet is based on the first three community cards, generally referred to as the 'Flop'. Because ten cards have in essence been removed from the deck to form the five initial 2-card hands, the distribution of hands is unique to this game. The frequency distribution is shown in the table below:

3-Card Distributions				
Hand	Headstart Hold'em		Standard 52-Card Deck	
	Occurrences	Frequency	Occurrences	Frequency
Straight Flush	27	0.2353%	48	0.2172%
Three of a Kind	24	0.2091%	52	0.2353%
Straight	370	3.2230%	720	3.2580%
Flush	543	4.7300%	1,096	4.9593%
Pair	1,888	16.4460%	3,744	16.9412%
Nothing	8,628	75.1568%	16,440	74.3891%
Totals	11,480	100.0000%	22,100	100.0000%

Based on the distributions in the above table, several possible pay tables have been developed for this Flop Bonus Bet. They are shown in the tables below:

Pay table HFB-01 for Headstart Flop Bonus		
Hand	Pays	Contribution
Straight Flush	40	11.9948%
Three of a Kind	40	6.4808%
Straight	8	22.5610%
Flush	6	23.6498%
Pair	2	32.8920%
Total Payback		97.58%
House Advantage ('vig')		2.42%

Pay table HFB-02 for Headstart Flop Bonus		
Hand	Pays	Contribution
Straight Flush	50 for 1	11.76%
Three of a Kind	30 for 1	6.27%
Straight	6 for 1	19.34%
Flush	4 for 1	18.92%
Pair	2 for 1	32.89%
Total Payback		89.18%
House Advantage		10.82%

Pay table HFB-03 for Headstart Flop Bonus		
Hand	Pays	Contribution
Straight Flush	40 for 1	9.41%
Three of a Kind	30 for 1	6.27%
Straight	5 for 1	16.11%
Flush	4 for 1	18.92%
Pair	2 for 1	32.89%
Total Payback		83.61%
House Advantage		16.39%

Pay table HFB-04 for Headstart Flop Bonus		
Hand	Pays	Contribution
Straight Flush	40 for 1	9.41%
Three of a Kind	30 for 1	6.27%
Straight	5 for 1	16.11%
Flush	3 for 1	14.19%
Pair	2 for 1	32.89%
Total Payback		78.88%
House Advantage		21.12%