



LIQUID AND GRIT

Slots Design Report

Competitive research and data insights for slots designers

TABLE OF CONTENTS

| | |
|---|-----------|
| NEW INNOVATIONS | 4 |
| Single Trigger Symbols | |
| Single Space Reels | |
| Row-Based Group Bonuses | |
| Scatter Pay One-Of-A-Kinds | |
| MARKET TRENDS | 9 |
| IP Themes | |
| Symbol Features | |
| Bonus Features | |
| Base Game Features | |
| MACHINE DEEP DIVES | 14 |
| Social Casino | |
| <i>Quick Gold</i> – POP! Slots | |
| <i>Ride 'Em Wild</i> – Caesars Slots | |
| <i>Quest in Wonderland</i> – House of Fun | |
| <i>Three Kings</i> – DoubleDown Casino | |
| Real Money | |
| <i>The Walking Dead 2</i> – Aristocrat | |
| <i>Ghostbusters Triple Slime</i> – IGT | |
| APPENDIX | 29 |
| Slots Player Personas | |
| Data Collection Process | |

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INTRODUCTION



"Fashions fade, style is eternal." – Yves Saint Laurent, one of the finest fashion designers of the twentieth century

Dear Slots Designer,

This month, we see innovation in social casino based on some classic real money gaming mechanics. Hit it Rich implemented a Single Symbol Trigger in *Honey Wins* to turn any spin into a big win with the last reel. This is an evolution of the iconic *Wheel of Fortune's* 3 x 3 bonus wheel symbol trigger. House of Fun released a machine with Single Space Reels and High 5 Casino released a machine with Scatter Pay One-Of-A-Kinds, two more machines derived from long-established real money gaming mechanics.

IP usage is still down with only three IP machines released in each of the past two months. Locked Symbols is on the rise, driven by House of Fun's progression map reward system. And, Free Spins After a Pick 'Em Bonus is an up-and-coming mechanic in social casino.

The Machine Deep Dives are either proven winners, innovative for social casino, or newly released in real money gaming. Caesars Slots' *Ride 'Em Wild* is a proven winner since it is a reskin of *American Glamour 2*. POP! Slots' *Quick Gold*, with its group bonus game experience, is a new innovation for social casino, and Aristocrat's *The Walking Dead 2* is a newly released machine in real money gaming.

Create timeless mechanics.

Brett Nowak
Editor-in-Chief

NEW INNOVATIONS

SINGLE TRIGGER SYMBOLS

Make a symbol on the rightmost reel that turns an ordinary spin into a great one. This ensures that the last reel's spin is always exciting

Magic Portal by NetEnt is another example of this mechanic that involves a special location on reels 1 and 5. When two symbols match in the special location, *magic* happens. As a result, every spin has players rooting for a particular symbol to land in the special spot on reel 5. Scatter Slots released *Bestial Twins* this month that emulates this design.

Base Game



In Hit it Rich *Honey Wins*, when the *Honey Comb* symbol lands on reel 5, a '?' is displayed. Then, a Major symbol is revealed and all Royals convert to this Major

Free Spins



In the free spins, the conversion mechanic triggers when the Queen Bee symbol lands with the honeycomb background, turning all Royals into Queen Bees

SINGLE SPACE REELS

Adopt this reborn variation on reel spins with spaces that spin individual reel strips

SC Games recently released this mechanic in *The Simpsons*. An older example of this mechanic is Bally's *Mega Winner 2*.

Base Game



House of Fun's *Quest in Wonderland* adopts single space reels spinning style

Number of Free Spins



Five or more scatter symbols trigger free spins. To determine the number of free spins, a number spins and then lands on each scatter symbol. The total of all the numbers equals the number of free spins awarded

ROW-BASED GROUP BONUSES

Make a group bonus game by inserting profile pictures into symbols and attaching multipliers to each player. Simplify the payout by making the numbers on the row the base payout

Free Spin Trigger



In POP! Slots' *Quick Gold*, players reserve a spot in the bonus round with three or more gold symbols hitting anywhere on the reels. Players may win multiple spots in the same bonus round

Multipliers



There is a multiplier on reel 1 on top of each player's profile picture. The multiplier is determined by the bet amount when the spot was reserved. The multiplier is applied to the number that lands on the other reels on that row

Additional Reels



As the free spins progress, additional reels are added to increase the payout

Bonus Spin



The last free spin awards one player in a *Winner Takes All* bonus spin

SCATTER PAY ONE-OF-A-KINDS

Provide a simpler style machine to create a 'what-you-see is what-you-get' experience for the *Plain Jane* slots player¹

This machine is based on the real money gaming *The Green Machine Deluxe* released by Bally. Incredible Technologies' *Money Rain Deluxe* is another relatively recent example of having all symbols as Scatter Pay One-Of-A-Kind.

Machine-Entry



In High 5 Casino's *The Green Machine Deluxe*, players receive a 5 reel that displays only blank reels upon machine-entry

Base Game



Spinning the machine triggers dollar amounts, free spin symbols, and jackpot symbols. The dollar amounts are multiplied by a set multiplier determined by the bet amount

Free Spins Trigger



Free spins are triggered by one or more free spins symbols

Jackpot Symbols



There are jackpots that are awarded by landing jackpot symbols

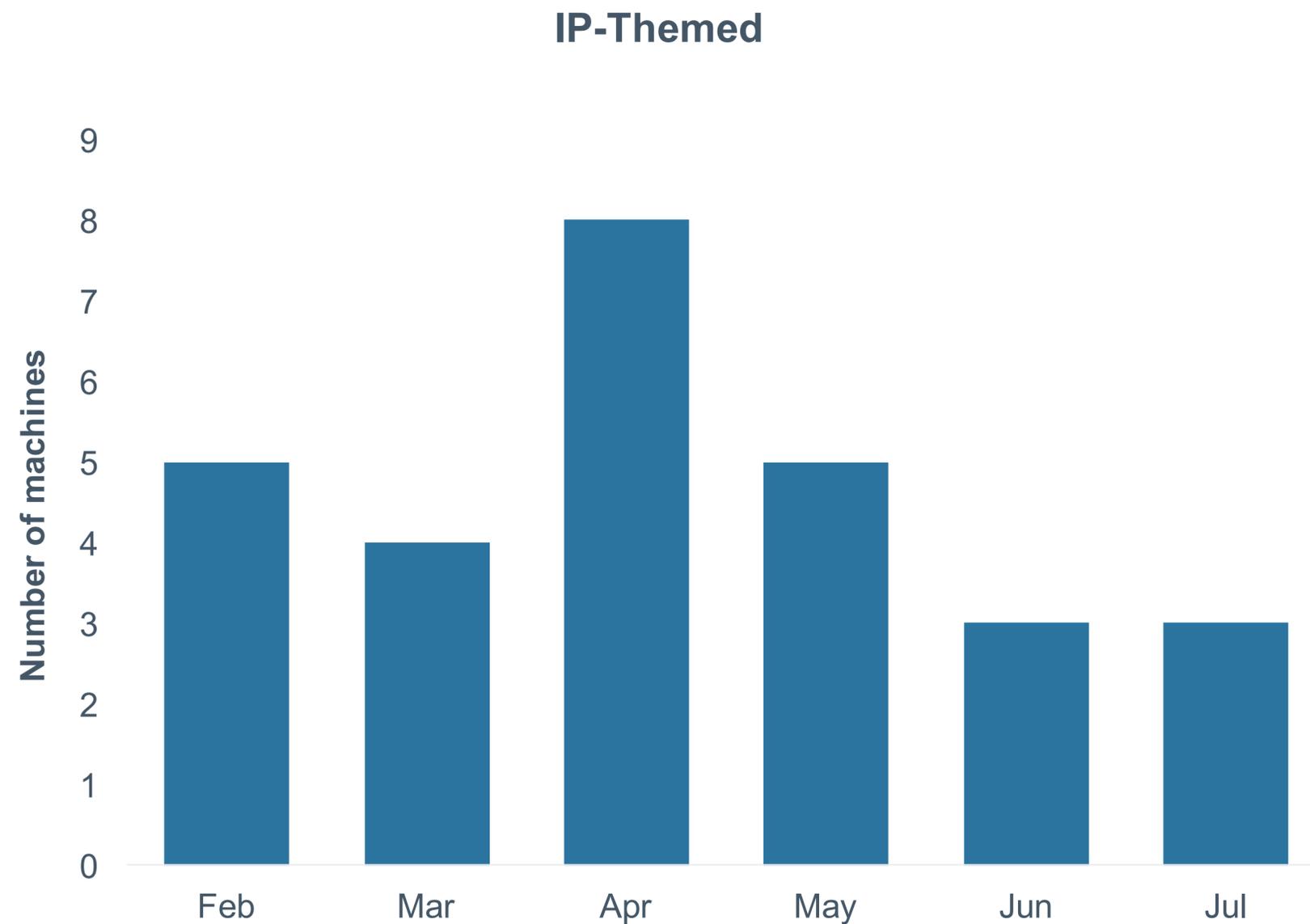
1. See the Appendix for Liquid and Grit's *Slots Player Personas*

MARKET TRENDS

Apps included in the trend data: DoubleDown Casino, Heart of Vegas, House of Fun, Gold Fish Casino, Slotomania, Jackpot Party, Hit it Rich, Caesars Slots, Quick Hit Slots, and Hot Shot Casino

IP THEMES

IP-themed machines are on the decline in featured apps. IP released: *Steve Harvey* in Hit it Rich, and *Dean Martin* in both Gold Fish Casino and Hot Shot Casino



Hit it Rich's *Steve Harvey Back for More*

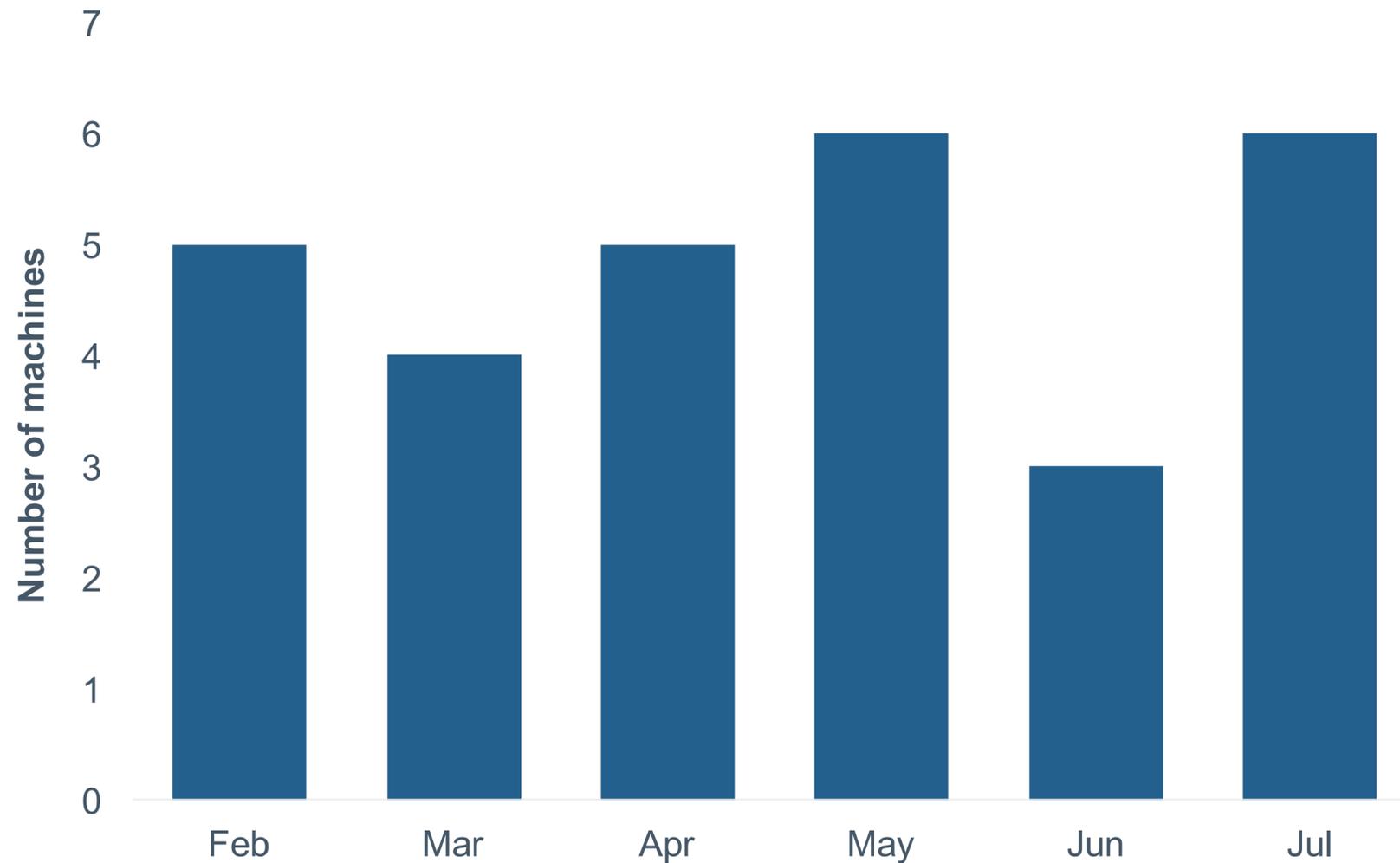


Hot Shot Casino's *Dean Martin VIP Party*

SYMBOL FEATURES

Locked Symbols or Sticky Wilds remain a strong and growing trend, recently adopted by several House of Fun machines

Locked Symbols



House of Fun's *Purrymid Prince*

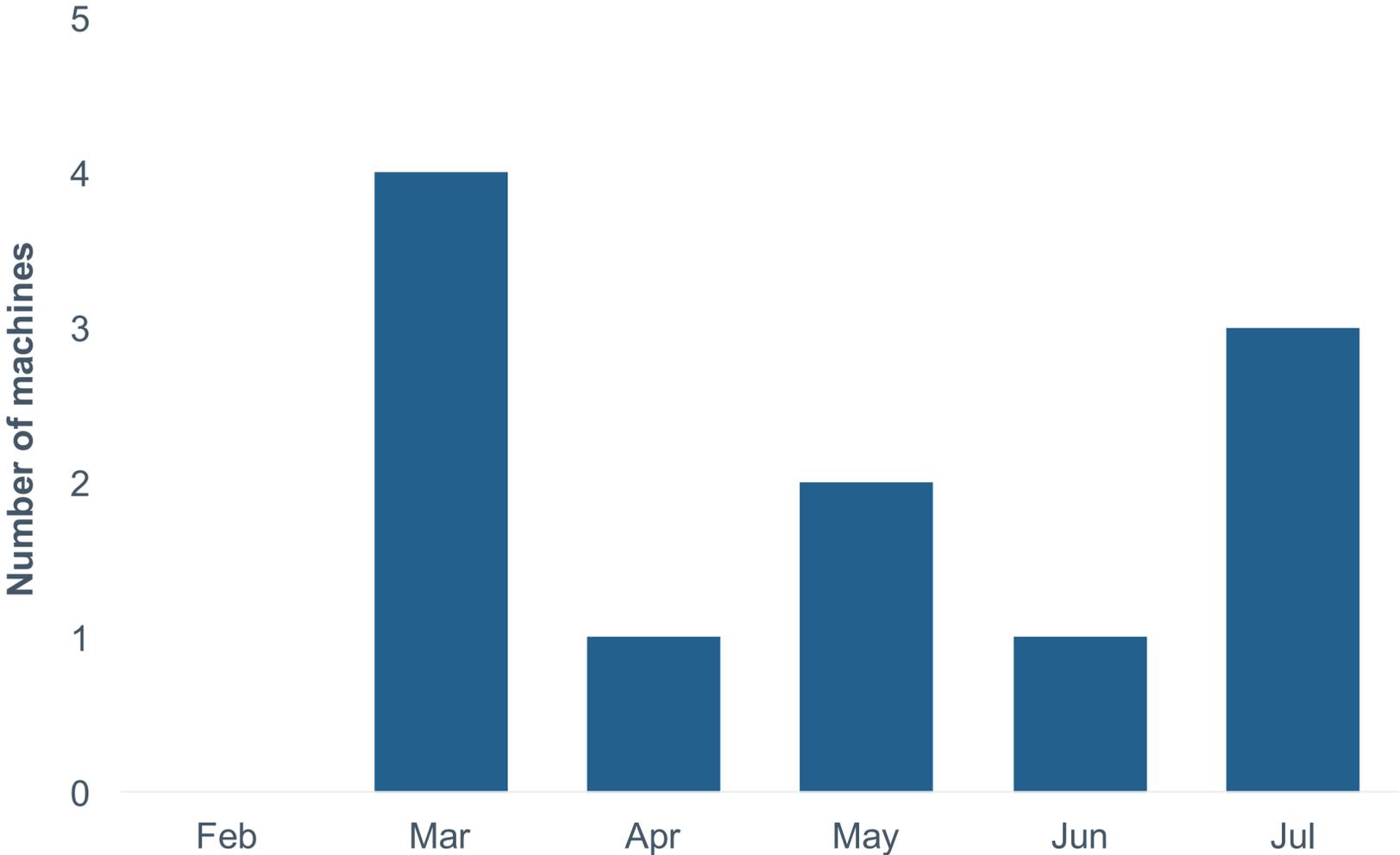


Quick Hit Slots' *Gauchos Gold*

BONUS FEATURES

Pick ‘Em Bonus with Free Spins is an up-and-coming trend to delight players with something extra. Also see Aristocrat’s *The Walking Dead 2* in Machine Deep Dives

Pick ‘Em Bonus with Free Spins



Gold Fish Casino's *Jackpot Empire*

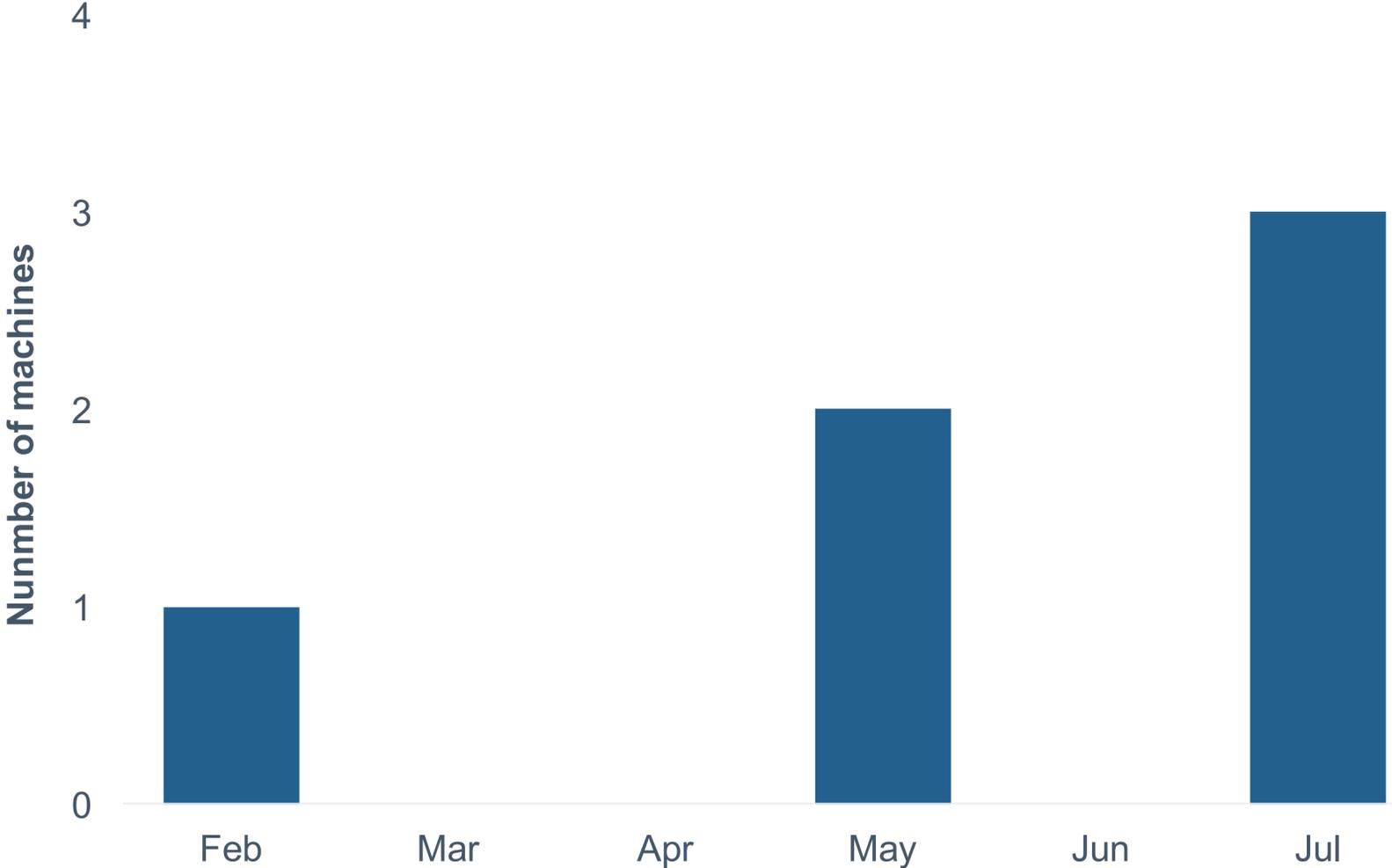


Jackpot Party's *Tropical Fish*

BASE GAME FEATURES

Conversion Mechanics, although spotty in their trend, are something to consider to stay ahead of competitors. See Single Trigger Symbols in New Innovations for more details

Conversion Mechanic



Quick Hit Slots' Lightning Jackpots



Hit it Rich's Honey Wins

MACHINE DEEP DIVES

SOCIAL CASINO

- *Quick Gold* – POP! Slots
- *Ride 'Em Wild* – Caesars Slots
- *Quest in Wonderland* – House of Fun
- *Three Kings* – DoubleDown Casino

QUICK GOLD

In POP! Slots' *Quick Gold*, the bonus is group play that employs profile pictures, multipliers, additional reels, and numbers on symbols

- *Quick Gold* is a stepper machine with six stand alone progressive jackpots (image 1).
- Three or more gold bars earn a spot on the *Golden Reel Bonus* (image 2).
- The *Golden Reel Bonus* has a total of 18 spots and begins when all spots have been filled (image 3).
- During the *Golden Reel Bonus*, prize amounts land on the reels as a string of numbers. Images of three players land on the first reel to determine the winner. On top of each player's image is a multiplier that is determined by the player's bet amount at the time the spot was reserved (image 4).
- After each free spin, the symbols of winning players are removed.
- The *Golden Reels Bonus* starts with five reels and upgrades with additional reels twice during the bonus round (image 5).
- On the bonus spin, which happens after six free spins, all players are returned to the wheel for a *Winner Takes All* bonus spin. In this spin, three players land on the reels, but only one player is picked as the winner (image 6).



QUICK GOLD STATS

Game play

| | |
|---------------------|-----|
| Hit frequency | 26% |
| Volatility | 4.0 |
| Spins until a bonus | 39 |

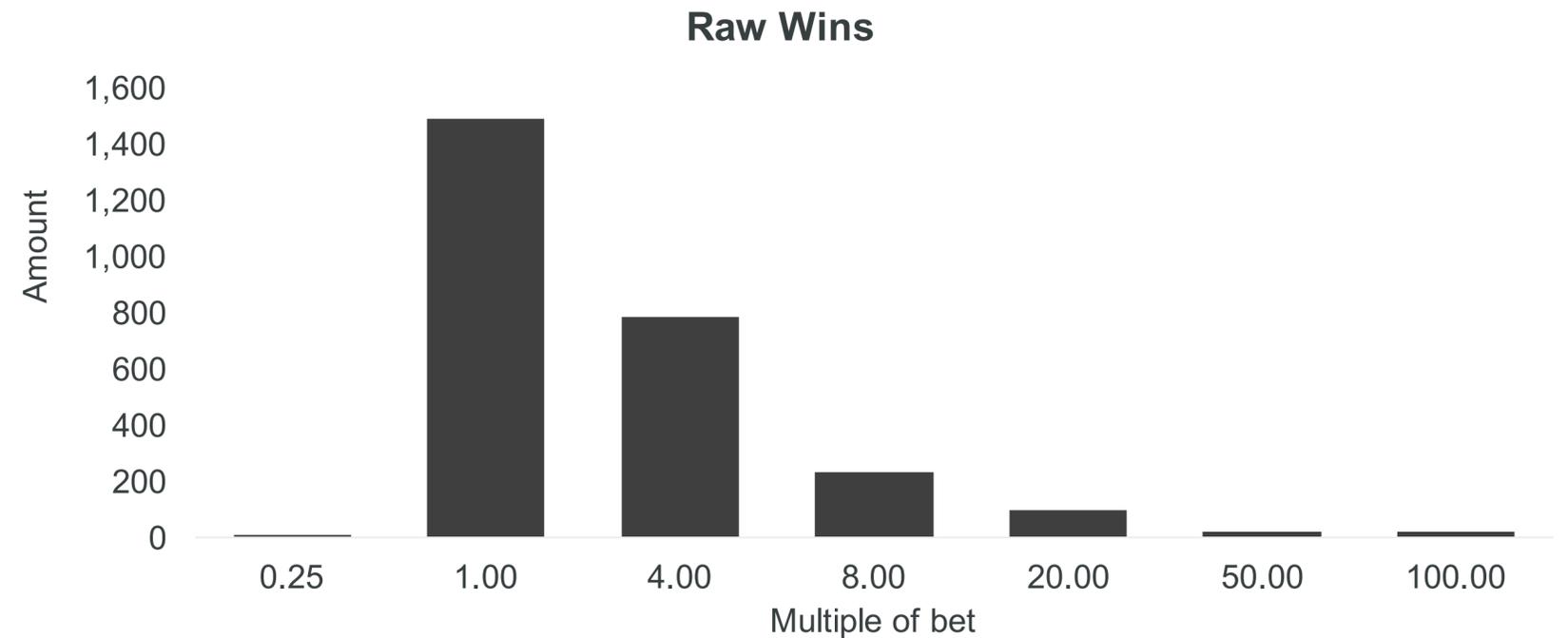
Distribution of RTP as % of total RTP

| | |
|-----------------|-----|
| Base game | 54% |
| Bonus game | 46% |
| Gold Reel Bonus | 28% |
| Jackpots | 18% |

RTP range

| | |
|---------------|-----|
| Minimum range | 70% |
| Median | 76% |
| Maximum range | 83% |

- Volatility is the standard deviation of the 10K payouts
- The distribution of RTP is base or bonus game RTP over total RTP
- RTP range is 90% confidence with 10K spins
- More info on our data collection process is in the Appendix



RIDE 'EM WILD

Caesars Slots' *Ride 'Em Wild*, a reskin of *American Glamour 2*, includes a bet up mechanic to unlock additional bonuses

- Caesars Slots' *Ride 'Em Wild* offers multi-play reels and five stand alone progressive jackpots (image 1).
- Any time during play, *Surprise Wild Reels* adds full reel wilds to either set of reels. Six or more scatter symbols trigger the corresponding *Flash Jackpot* (image 2).
- Players are advised that higher bets open more bonuses. Increasing bets unlocks up to three different bonuses, with active bonuses indicated (image 3). (This mechanic was first mentioned in New Innovations in the April 2017 Slots Design Report).
- To trigger a bonus, a bonus symbol and two scatter symbols must land on either reel set (image 4).
- The Fun Wheel Bonus contains an outer ring of coin prizes, an inner multiplier ring, and a spin button (image 5).
- The 5 *Wild Reel Free Spins* is played on two reel sets with full reel wilds appearing on each spin. *Outlaw Respins* awards six spins played on four reel sets (image 6).



RIDE 'EM WILD STATS

Game play

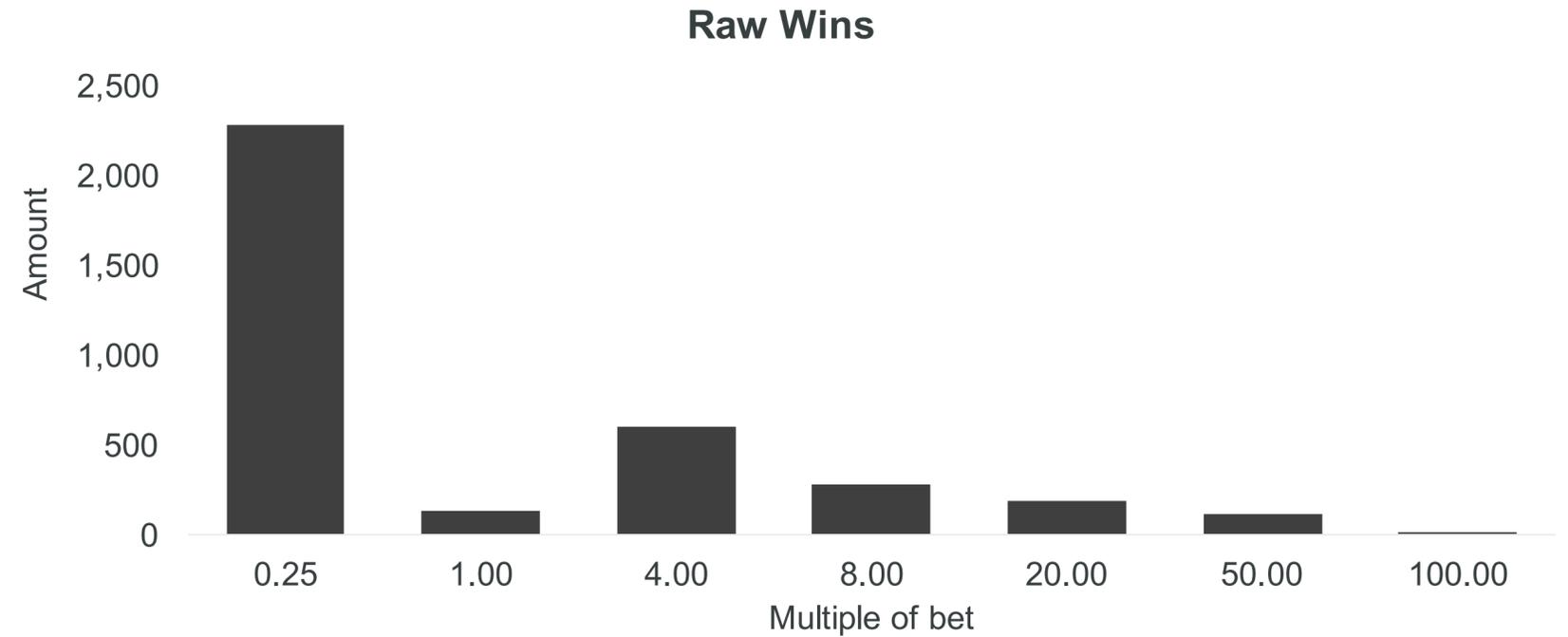
| | |
|---------------------|-----|
| Hit frequency | 36% |
| Volatility | 3.6 |
| Spins until a bonus | 39 |

Distribution of RTP as % of total RTP

| | |
|-------------|-----|
| Base game | 51% |
| Bonus games | 49% |
| Free Spins | 28% |
| Jackpots | 21% |

RTP range

| | |
|---------------|-----|
| Minimum range | 81% |
| Median | 87% |
| Maximum range | 93% |



QUEST IN WONDERLAND

House of Fun's *Quest in Wonderland* extends the progression system to a map. On the map, players are awarded specific bonus configurations every fourth node

- Players collect hearts to fill the meter (image 1).
- Every fourth step completed awards free spins with a specific Sticky Wild configuration. The other steps reward a pick 'em bonus (image 2).
- The pick 'em bonus displays ten teapots. Collecting keys activates a x2, x3 or x5 win multiplier. Uncovering a coin amount on any pick ends the bonus (image 3).
- The free spins bonus is awarded with a pattern of Sticky Wilds (image 4).
- On the last step of the map, the free spins contains 12 center reel Sticky Wilds (image 5).
- The number of free games awarded is determined by the triggering bonus symbols. Each bonus symbol that hits then spins a number. The sum of all the numbers determines the number of free spins (image 6).



QUEST IN WONDERLAND STATS

Game play

| | |
|---------------------|------|
| Hit frequency | 32% |
| Volatility | 16.4 |
| Spins until a bonus | 100 |

Distribution of RTP as % of total RTP

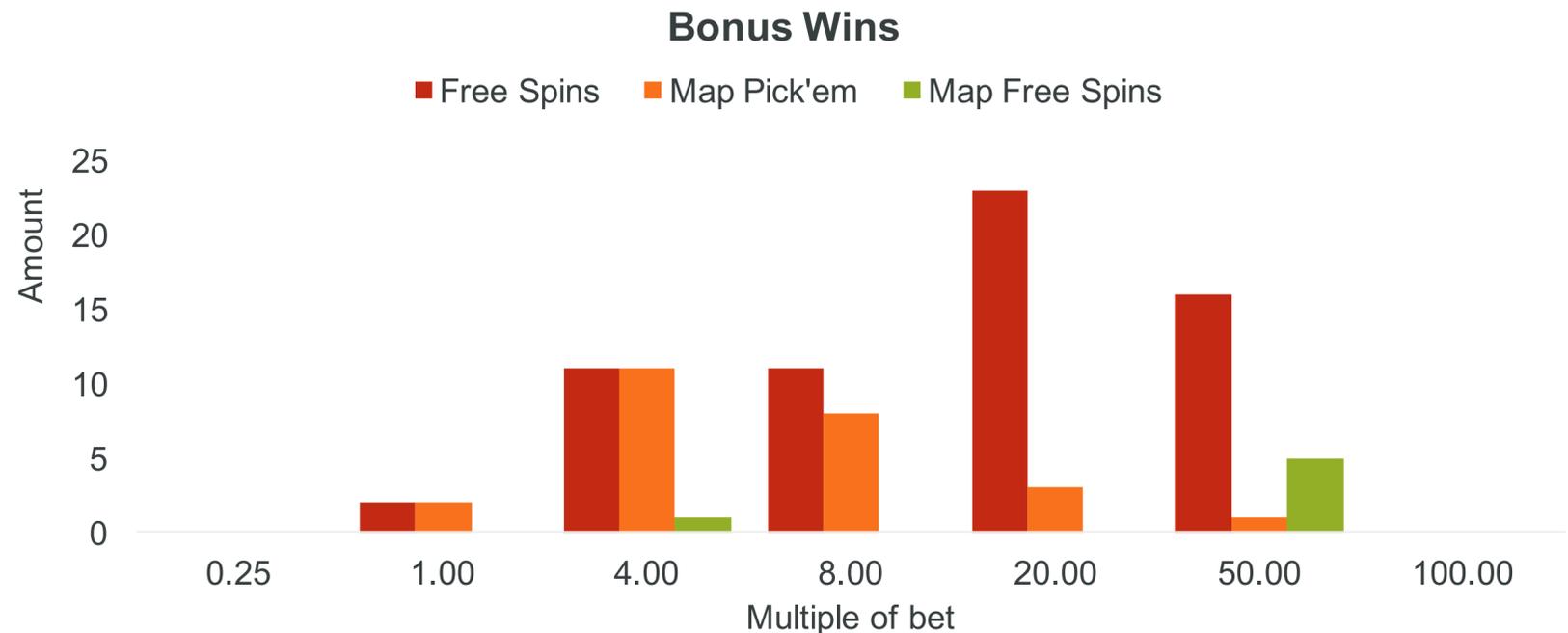
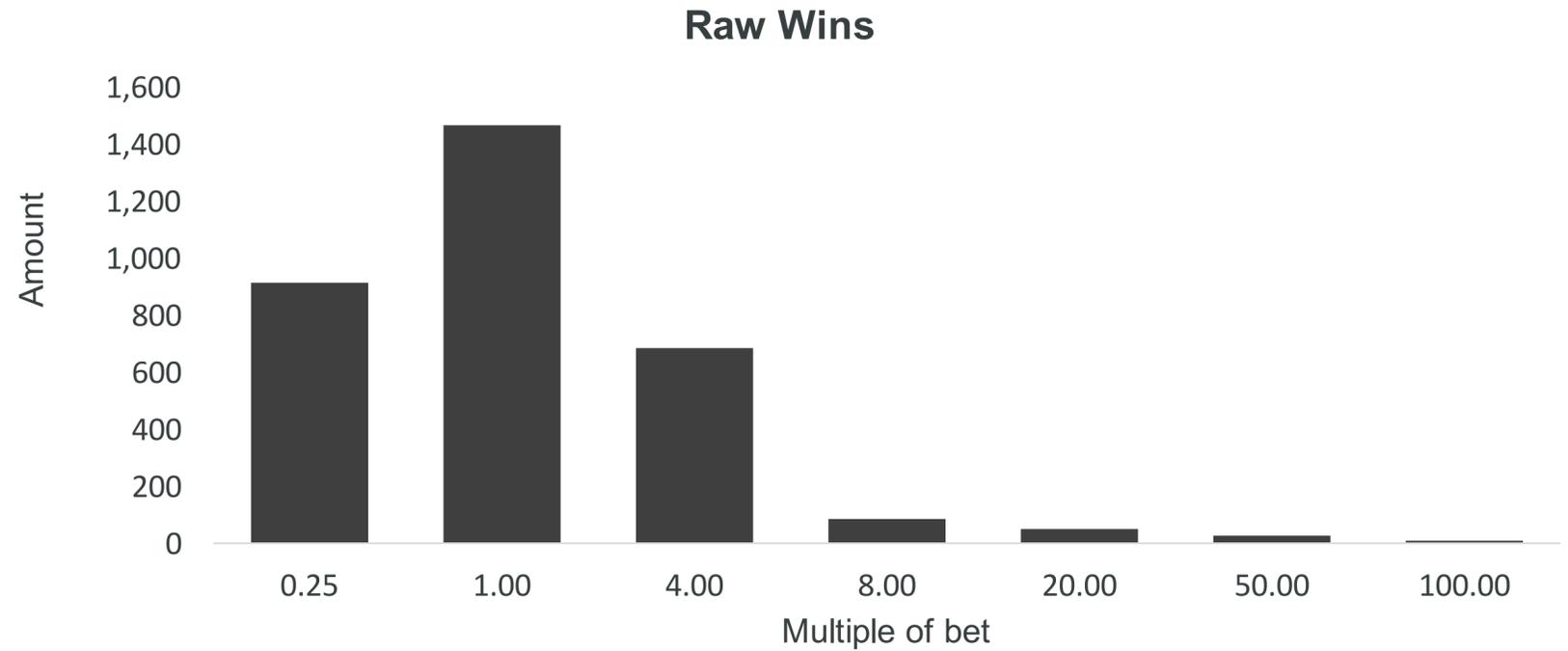
| | |
|----------------|-----|
| Base game | 45% |
| Bonus game | 55% |
| Free Spins | 50% |
| Map Pick 'Em | 2% |
| Map Free Spins | 4% |

RTP range

| | |
|---------------|-----|
| Minimum range | 36% |
| Median | 64% |
| Maximum range | 91% |

>1,000x Wins

| | |
|--------------------|------|
| Number of jackpots | 1 |
| Multiple of bet | 1.6K |



THREE KINGS

DoubleDown Casino's *Three Kings* boosts free games bonus rounds by adding a progressive feature

- Three Progressive Free Games meters are displayed to the side of a 4 x 5 reel set (image 1).
- Each of the progressive meters may randomly increase as more games are spun. Flames appear within the meters when the number of free games reaches an average. This *does not* indicate a higher chance of triggering the free games (image 2).
- Any three same-colored bonus symbols triggers the *Progressive Free Games* feature. Green bonus symbols only appear on reels 1-3, red on 2-4, and purple on reels 3-5 (image 3).
- Once triggered, a dialogue appears displaying the number of free games won and the additional wild symbols (image 4).



THREE KINGS STATS

Game play

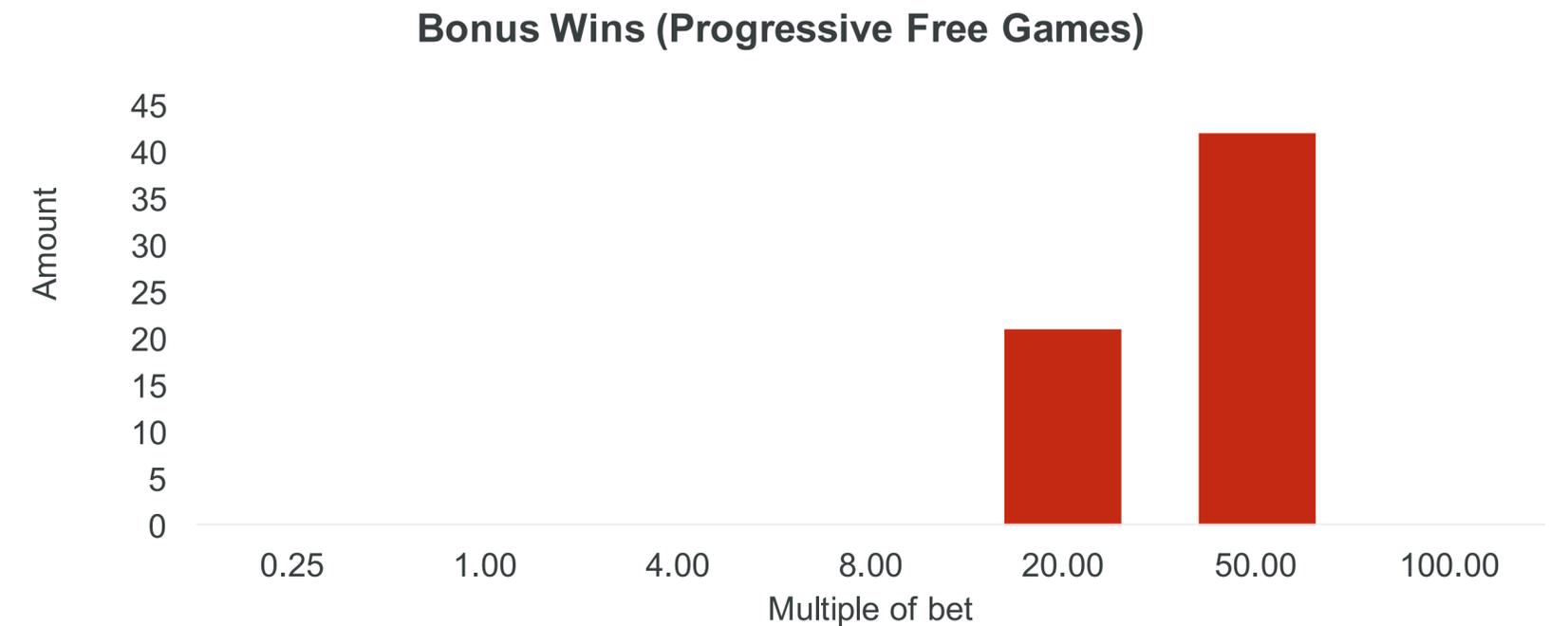
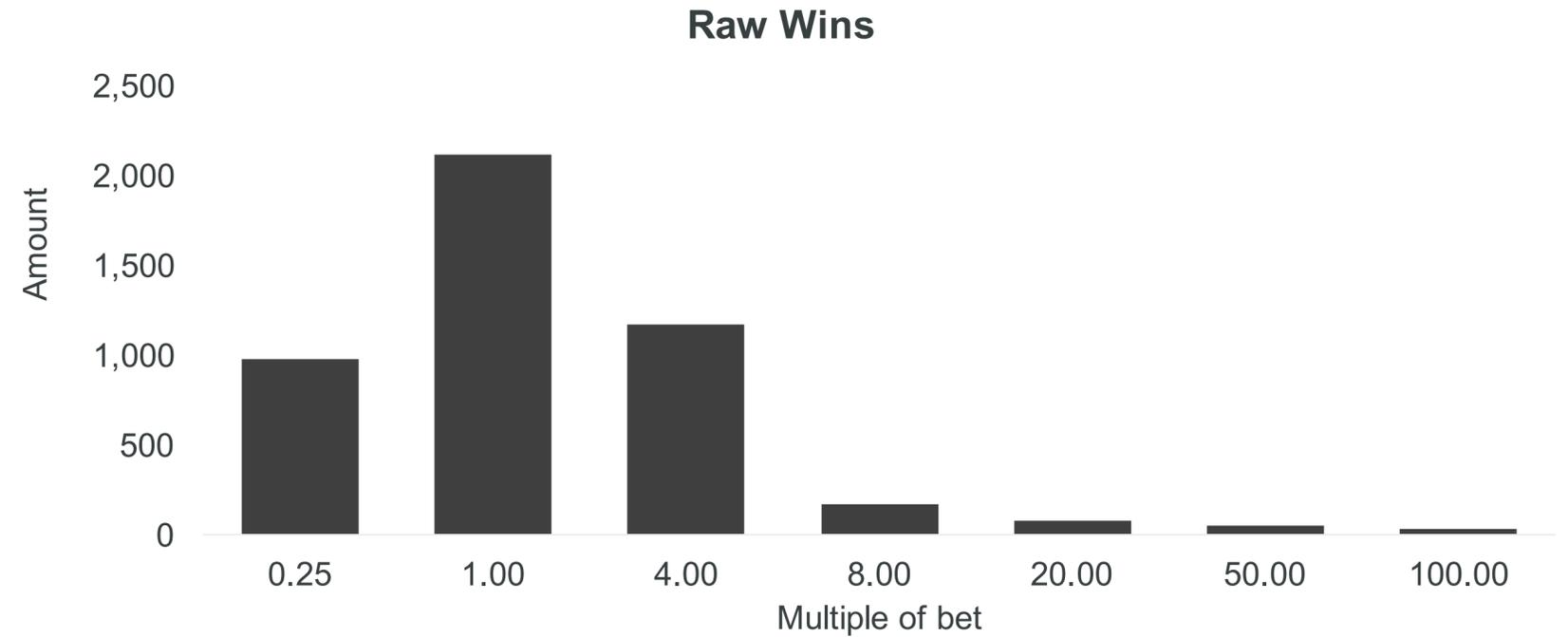
| | |
|---------------------|-----|
| Hit frequency | 46% |
| Volatility | 7.2 |
| Spins until a bonus | 112 |

Distribution of RTP as % of total RTP

| | |
|--|-----|
| Base game | 71% |
| Bonus game (Progressive Free Games) | 29% |

RTP range

| | |
|---------------|------|
| Minimum range | 86% |
| Median | 98% |
| Maximum range | 110% |



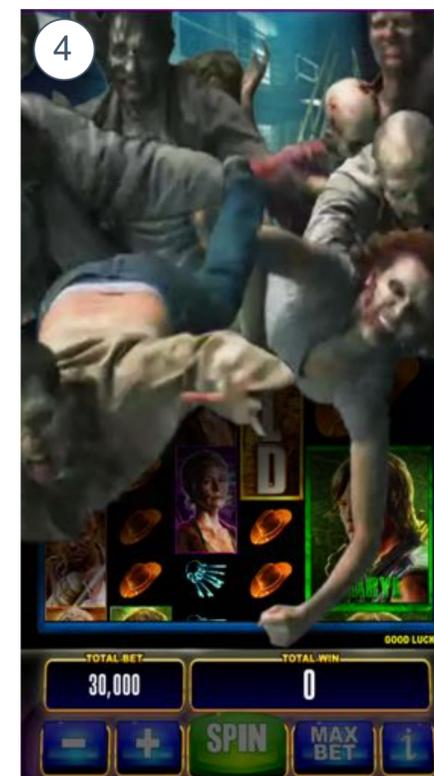
REAL MONEY

- *The Walking Dead 2* – Aristocrat
- *Ghostbusters Triple Slime* – IGT

THE WALKING DEAD 2

Aristocrat's *The Walking Dead 2* features an Expanding Reel and a Pick 'Em Bonus with Free Spins

- *The Walking Dead 2* displays a 5 x 5 reel set with four progressive jackpots (image 1).
- *Reel Growth* triggers when a *Walker Wild Multiplier* or tall wild combines with a top symbol. Reels expand to the top of the character image, adding up to 300 paylines for a 11 x 5 reel set (image 2).
- The *Michonne Attack* feature may trigger at the end of any base game spin. High symbols displayed on reels 1 - 4 are converted to the same symbol. Randomly, low symbols on reel 5 may be converted at the same time (image 3).
- In the base game, the *Wild Horde* feature begins with zombies falling over the reels. Additional wilds are added to the reels that may contain *Reel Growth* wilds and *Walker Wild Multipliers* (image 4).
- Three or more blue scatter symbols landing on the reels triggers the free games feature. Players pick one of five boxes to reveal the number of free games, or pick again with spin multipliers (image 5).
- Three scatters, with at least one red, triggers the *Jackpot Bonus*. Players pick from 12 boxes until three matching jackpot symbols are revealed. Boxes may contain a x2, x3, x4, x5, or x10 jackpot multiplier. Upon the completion of the *Jackpot Bonus*, players are awarded a free games pick 'em bonus to play (image 6).



THE WALKING DEAD 2 STATS

Game play

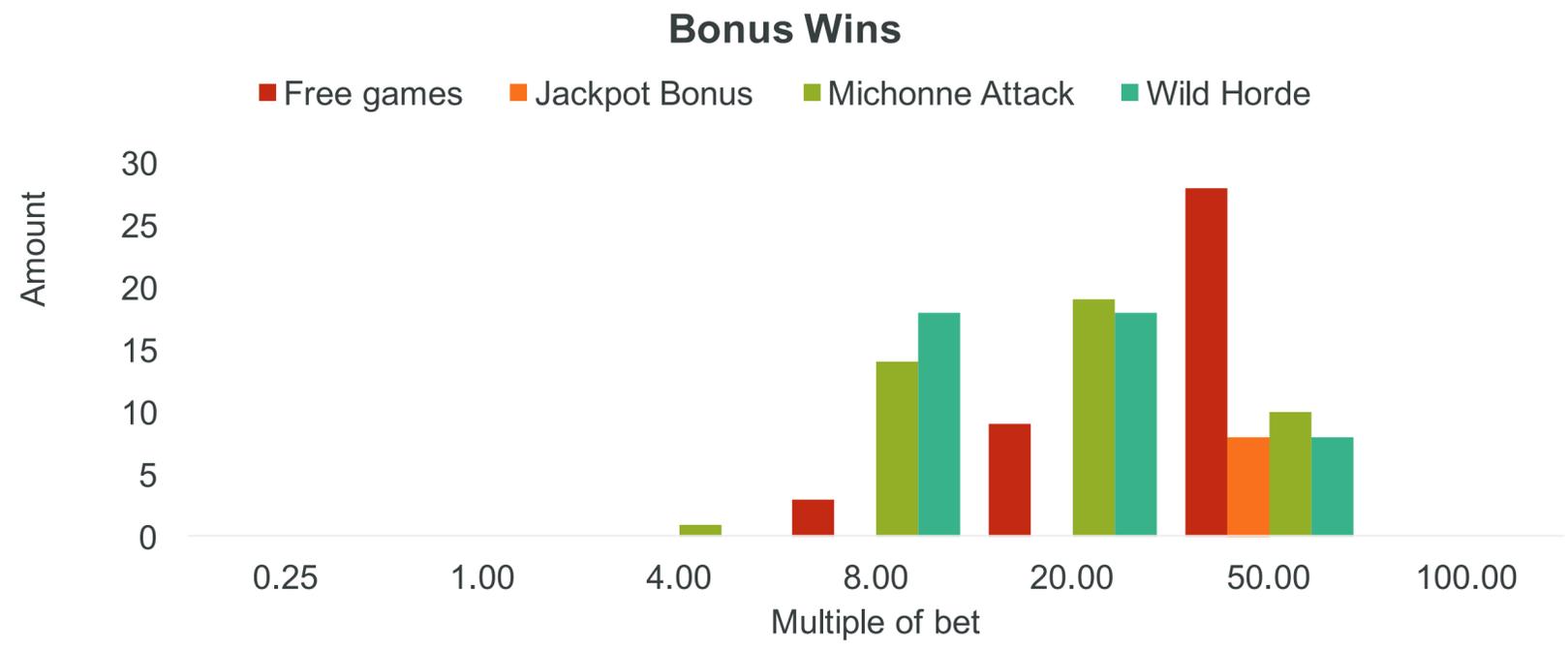
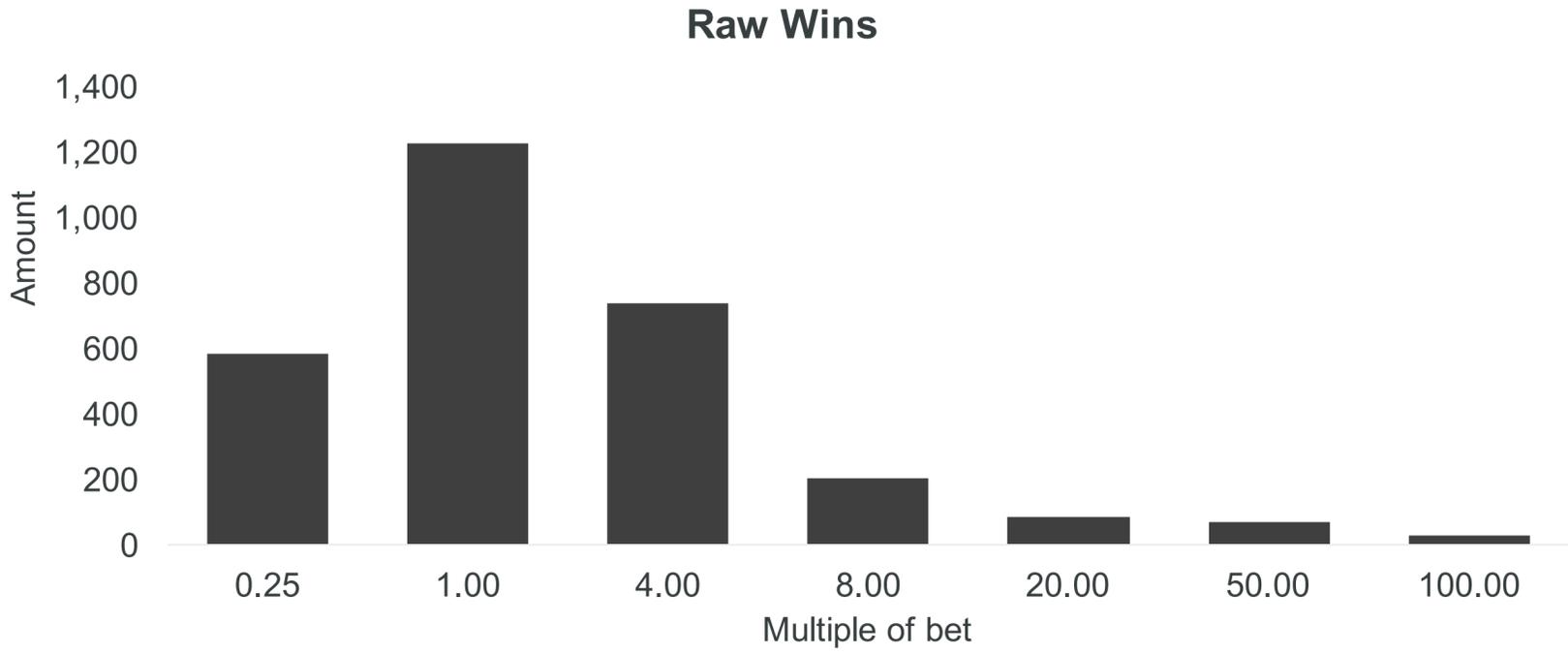
| | |
|---------------------|------|
| Hit frequency | 29% |
| Volatility | 10.3 |
| Spins until a bonus | 63 |

Distribution of RTP as % of total RTP

| | |
|-----------------|-----|
| Base game | 40% |
| Bonus game | 60% |
| Free Games | 30% |
| Jackpot Bonus | 6% |
| Michonne Attack | 12% |
| Wild Horde | 12% |

RTP range

| | |
|---------------|------|
| Minimum range | 85% |
| Median | 102% |
| Maximum range | 119% |



GHOSTBUSTERS T. SLIME

IGT's *Ghostbusters Triple Slime* offers multiple wheel features and adds onto the pick 'em bonus with a three-wheel bonus spin

- *Ghostbusters Triple Slime* machine offers a n x n reel configuration and both way multi-pays (image 1).
- Landing three or more scatter symbols triggers an on-reel bonus (image 2).
- In the *Slimer Scatter Bonus*, scatter symbols convert to on-reel spinning wheels. Coins awarded are the total of all wheel amounts multiplied by the coin value (image 3).
- Three or more bonus symbols landing on the reels triggers the *Triple Slime Bonus* (image 4).
- The *Triple Slime Bonus* starts with a pick 'em of 12 ghosts, revealing pointers for three different colored wheels. The number of picks awarded is equal to the number of triggering symbols (image 5).
- After picks and pointers are revealed, the *Triple Slime Bonus* continues. Each pointer that is won lights up on the three large wheels displayed. The wheels spin, awarding wedge amounts from all active pointers (image 6).



GHOSTBUSTERS TRIPLE SLIME STATS

Game play

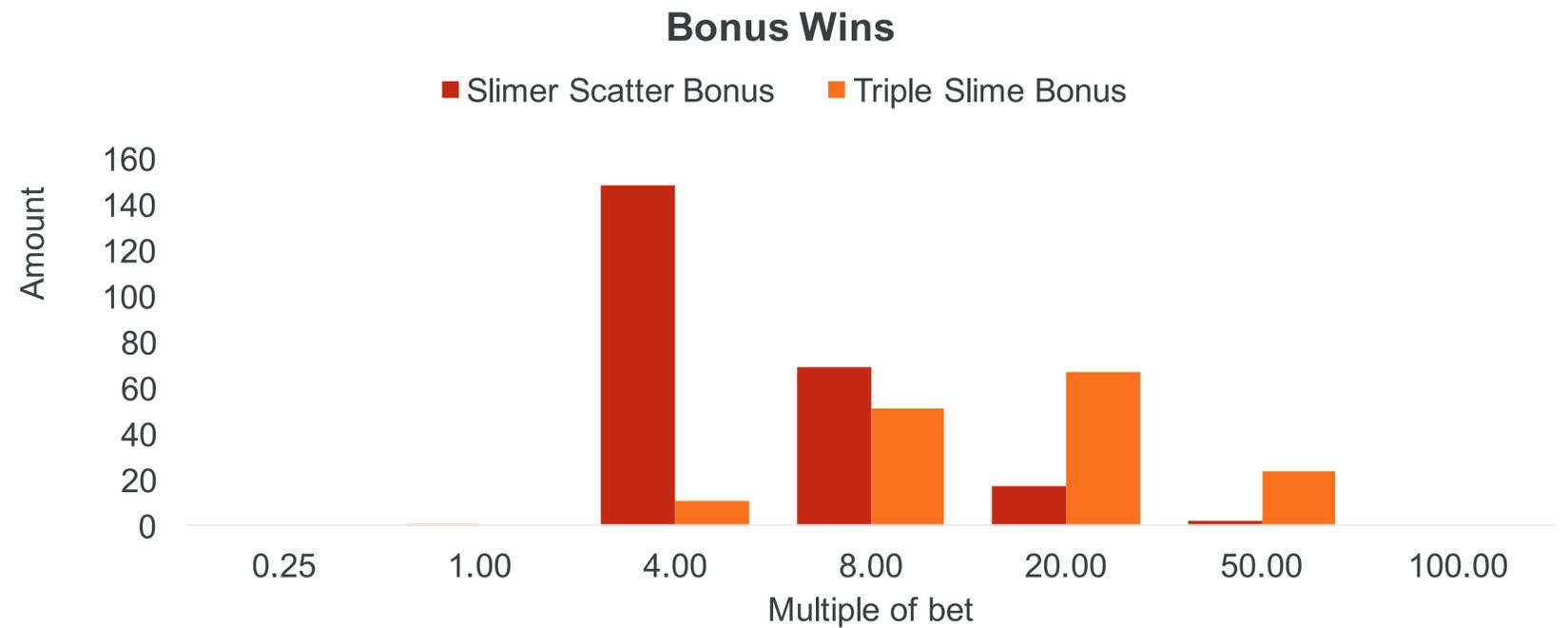
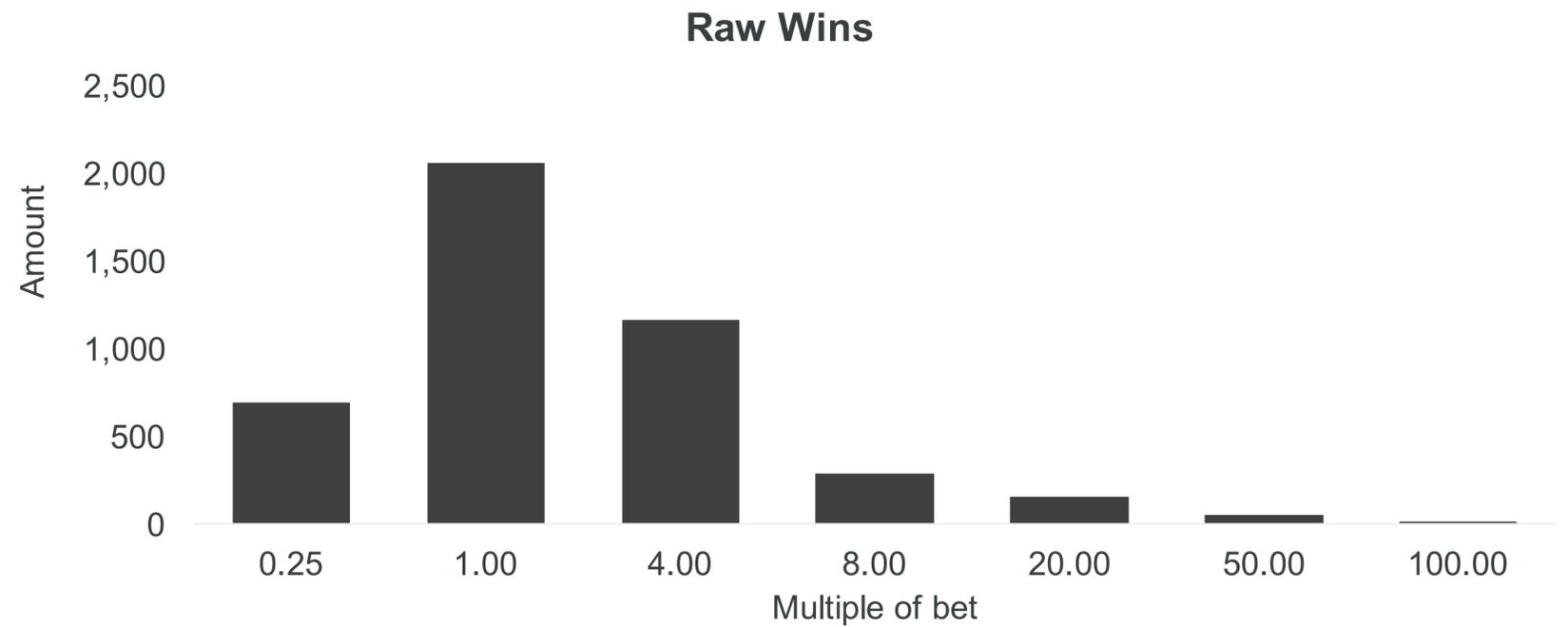
| | |
|---------------------|-----|
| Hit frequency | 44% |
| Volatility | 5.2 |
| Spins until a bonus | 25 |

Distribution of RTP as % of total RTP

| | |
|----------------------|-----|
| Base game | 64% |
| Bonus game | 36% |
| Slimer Scatter Bonus | 10% |
| Triple Slime Bonus | 26% |

RTP range

| | |
|---------------|------|
| Minimum range | 91% |
| Median | 100% |
| Maximum range | 108% |



APPENDIX

SLOTS PLAYER PERSONAS

| | PLAIN JANE | NIGHT-OUT NANCY | ENTERTAIN-ME EDDIE | MR. AND MRS. RICARDO |
|--|---|---|---|--|
| Desire | Utility | Excitement | Multi-Purpose | Relaxation |
| Motivation | Looking for something to do: kill time and reduce boredom | Wants a buzz: thrill of winning a jackpot, relaxing, and having a good time | Considers machines “lucky” or fun to play | Socialization, have fun, and relieve day-to-day stress |
| Features for choosing one game over another | Denomination that I want to play | Bet within budget, fun game to play | Fun game to play, good chance of winning | Fun game to play, denomination want to play |
| % of machines played with progressives | 29% | 40% | 37% | 25% |
| Player Income | Medium-high | High | Low | Medium-low |
| % female | 54% | 59% | 45% | 48% |
| Size of group | 20% | 28% | 27% | 26% |

DATA COLLECTION PROCESS

Machine observations are from 10,000 spins and an real money gaming accepted statistical process to determine 90% confidence levels of a machine's RTP. Recommendations, information and data comes from market research, app intelligence tools and deep analysis of the games

Machine information

- The RTP range is found using a sample of 10,000 spins, which is approximately 20 hours of play.
- To find the RTP range with 90% confidence, the median payout of the 10K spin +/- (standard error) x (z-score for 90% confidence) is calculated.
- The standard error is (standard deviation) / $\sqrt{\text{sample size}}$ and the z-score for 90% confidence is 1.65.
- For example, the median payout for *Zombie Prom* after 10K spins was 103% with a standard deviation of 3.3.
- The standard error is $3.3/(\sqrt{10,000})$, which equals 3.3%
- The RTP range for *Zombie Prom* is then 103% +/- (1.65 x 3.3%).
- Based on this sample, the result is a 90% confidence that the real RTP of *Zombie Prom* falls between 97% and 109%.

Market research

- Each game is reviewed daily for updates, regardless of whether the game has been updated through the App Store.
- Transaction information comes from the iOS App Store's In-App Purchases tab. These transactions are ranked based on the number of transactions.
- Las Vegas player insights come from online sources, such as the Las Vegas Convention and Visitors Authority and the UNLV Center for Gaming Research.
- Progressive jackpot information comes from online research, specifically from wizardofodds.
- Trending revenue, downloads and package-rank data come from Priori Data, a Liquid and Grit partner.

Immature poets imitate; mature poets steal; bad poets deface what they take, and good poets make it into something better, or at least something different

– T.S. Elliot

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